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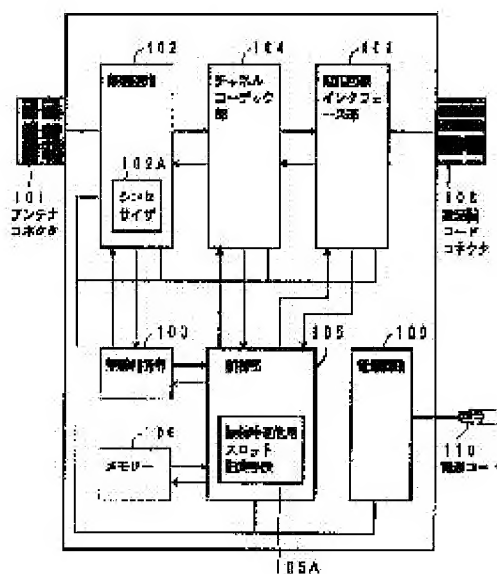
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(54) WIRELESS LOCAL LOOP SYSTEM AND ITS FIXED TELEPHONE SUBSCRIBER UNIT

(57)Abstract:

PROBLEM TO BE SOLVED: To provide an FSU for a WLL system by allowing one FSU to attain simultaneous speech for a plurality of phone calls to decrease the number of the FSUs and to minimize the configuration of a radio section and a control section in use.

SOLUTION: The fixed telephone subscriber unit FSU is a unit for the wireless local loop WLL system to which a plurality of telephone sets connect by using wired-lines and a radio base station management device and a radio base station connecting to a telephone line network connect by using radio channels and which uses the TDMA/TDD system for communication, and is provided with a control means 105 that controls connection of telephone sets and with a connection time communication slot designation means 105A that designates a communication slot used for a communication channel from the FSU to the radio base station in the case that a telephone set connected by a wired-line starts communication to the radio base station to designate so that slots used by telephone sets are not overlapped respectively.



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CLAIMS

[Claim(s)]

[Claim 1] It connects by base transceiver station management equipment, and the base transceiver station and wireless by which it connected with the cable and 1 or two or more telephones were connected to the telephone network. The control means which is the fixed telephone subscriber unit of the wireless local loop system which communicates with TDMA / TDD method, and controls connection of two or more telephones, When starting a communication link to said base transceiver station from the telephone connected with said cable It has a slot assignment means for a communication link at the time of the connection which specifies the slot for a communication link used from a fixed telephone subscriber unit as a channel for a communication link to a base transceiver station. The fixed telephone subscriber unit of the wireless local loop system characterized by making it the slot which two or more telephones use not lap.

[Claim 2] It connects by base transceiver station management equipment, and the base transceiver station and wireless by which it connected with the cable and 1 or two or more telephones were connected to the telephone network. The control means which is the fixed telephone subscriber unit of the wireless local loop system which communicates with TDMA / TDD method, and controls connection of two or more telephones, When starting a communication link to said base transceiver station from the telephone connected with said cable It has an advice means of a slot condition at the time of the connection which notifies the current busy condition of the TDMA/TDD slot in said fixed telephone subscriber unit. The fixed telephone subscriber unit of the wireless local loop system characterized by receiving assignment by using an intact slot as the slot for a communication link from a base transceiver station according to advice of the busy condition of said slot.

[Claim 3] When said control means judged, that communication link quality deteriorated during the communication link between said fixed telephone subscriber units and base transceiver stations When transmitting the channel change-request message for a communication link from said fixed telephone subscriber unit to a base transceiver station The fixed telephone subscriber unit of the wireless local loop system according to claim 1 or 2 characterized by having a slot assignment means for a communication link during the communication link which specifies the slot for a communication link which a fixed telephone subscriber unit uses as a channel for a communication link.

[Claim 4] The fixed telephone subscriber unit of the wireless local loop system according to claim 1 or 2 characterized by to have an advice means of a slot condition during the communication link which notifies the current busy condition of the TDMA / TDD slot in a fixed telephone subscriber unit when said control means judged that communication link quality deteriorated during the communication link between said fixed telephone subscriber units and base transceiver stations and the channel change-request message for a communication link is transmitted from said fixed telephone subscriber unit to a base transceiver station .

[Claim 5] It has a fixed telephone subscriber unit according to claim 1 or 2 and base transceiver station management equipment connected to the telephone network. Said fixed telephone subscriber unit holds the telephone number of two or more telephones connected. It has the location registration system means which carries out location registration of said two or more telephone numbers of all by 1 time of the location registration demand message to base transceiver station management equipment. Said base transceiver station management equipment is a wireless local loop system characterized by having a location registration system means to recognize all the telephone numbers received from said fixed telephone subscriber unit to be the telephone number registered into one fixed telephone subscriber unit, and to process them.

[Claim 6] It has a fixed telephone subscriber unit according to claim 1 or 2 and base transceiver station management equipment connected to the telephone network. Said fixed telephone subscriber unit holds the

telephone number of two or more telephones connected. Apart from the telephone number of each of said telephone, it has a specific number as a fixed telephone subscriber unit. It has the location registration system means which carries and carries out location registration of said specific number to a location registration demand message. Said base transceiver station management equipment by the specific number received from said fixed telephone subscriber unit The wireless local loop system characterized by having a location registration system means against two or more telephone numbers of all registered into said fixed telephone subscriber unit to recognize it as it being location registration.

[Claim 7] By making 4 figures into the same value under two or more telephone numbers corresponding to 1 or two or more telephones which are connected with said cable, and performing location registration The arrival-of-the-mail message to all the telephones connected to the fixed telephone subscriber unit The fixed telephone subscriber unit of the wireless local loop system according to claim 1 or 2 characterized by making it receive by the channel which is equivalent to the same arrival group in the message for control which a base transceiver station transmits.

[Claim 8] The arrival-of-the-mail approach of the fixed telephone subscriber unit of the wireless local loop system which make 4 figures the same value under the telephone number of two or more telephones connect to one fixed telephone subscriber unit , and be characterize by to consist of each process which receive the arrival-of-the-mail message to all the telephones that perform location registration to a base transceiver station , and be connect to the fixed telephone subscriber unit by the channel which be equivalent to the same arrival group in the message for control which transmit from a base transceiver station .

[Claim 9] It is the base transceiver station of the wireless local loop system connected with the fixed telephone subscriber unit to which it connects with a telephone network and 1 or two or more telephones are connected with the cable on radio by the TDMA/TDD method. When dispatch or arrival new when said fixed telephone subscriber unit has already used it as a slot for the one or more slot communication link in 4 slots arises based on the information on said fixed telephone subscriber unit, The base transceiver station of the wireless local loop system characterized by having a slot distribution means at the time of the connection controlled not to specify the slot of the same number as a slot for a communication link.

[Claim 10] It is base transceiver station management equipment connected through the base transceiver station connected with the fixed telephone subscriber unit to which it connects with a telephone network and 1 or two or more telephones are connected with the cable on radio by the TDMA/TDD method. When dispatch or arrival new when said fixed telephone subscriber unit has already used it as a slot for the one or more slot communication link in 4 slots arises based on the information on said fixed telephone subscriber unit, Base transceiver station management equipment of the wireless local loop system characterized by having a slot distribution means at the time of the connection controlled not to specify the slot of the same number as a slot for a communication link.

[Claim 11] It is the base transceiver station of the wireless local loop system connected with the fixed telephone subscriber unit to which it connects with a telephone network and 1 or two or more telephones are connected with the cable on radio by the TDMA/TDD method. When the fixed telephone subscriber unit has already used it based on the information on said fixed telephone subscriber unit as a slot for the two or more slot communication link in 4 slots When the control means of said fixed telephone subscriber unit judged with communication link quality having deteriorated When said base transceiver station receives the channel change-request message for a communication link from said fixed telephone subscriber unit The base transceiver station of the wireless local loop system characterized by having a slot distribution means during the communication link controlled to specify the intact slot number which other telephones have not already used as a channel for modification.

[Claim 12] It is base transceiver station management equipment connected through the base transceiver station connected with the fixed telephone subscriber unit to which it connects with a telephone network and 1 or two or more telephones are connected with the cable on radio by the TDMA/TDD method. When the fixed telephone subscriber unit has already used it based on the information on said fixed telephone subscriber unit as a slot for the two or more slot communication link in 4 slots When the control means of said fixed telephone subscriber unit judged with communication link quality having deteriorated When said base transceiver station management equipment receives the channel change-request message for a communication link from said fixed telephone subscriber unit Base transceiver station management equipment of the wireless local loop system characterized by having a slot distribution means during the communication link controlled to specify the intact slot number which other telephones have not already used as a channel for modification.

[Claim 13] It connects on radio with the base transceiver station and TDMA/TDD method which were connected to the telephone network. It is the fixed telephone subscriber unit of the wireless local loop system to which 1 or two or more telephones are connected with the cable. While establishing the control means which connects two or more telephones and using one slot as three slots and a slot for control as a slot for a communication link in the case of said one fixed telephone subscriber unit When the dispatch for urgent occurs from said another telephone connected, as a slot for a communication link The inside of three slots in use, The fixed telephone subscriber unit of the wireless local loop system characterized by having the urgent dispatch control means which is made to end the communication link of one slot and assigns the slot as a slot for urgent dispatch.

[Claim 14] It is the fixed telephone subscriber unit of the wireless local loop system according to claim 1 or 2 which the slot for control is stopped and a maximum of four telephones enable the call to the same time amount when using all four slots as a slot for a communication link, and is characterized by having the slot control means for control controlled to revive said stopped slot for control when the slot for a communication link turns into three or less slots.

[Claim 15] When a slot in use turns into three slots from four slots as a slot for a communication link Usually, when the slot currently assigned as a slot for control is using it as a communication link slot, It has the slot control means for a communication link which notifies the change request of a communication link slot in use to a base transceiver station. Usually, the fixed telephone subscriber unit of the wireless local loop system according to claim 1, 2, or 11 by which it is making [revitalize the slot currently assigned as a slot for control as a slot for control] characterized.

[Claim 16] The control means which controls two or more telephones connected with the cable is established in one case. It is the fixed telephone subscriber unit of the wireless local loop which enabled it to communicate a maximum of four slots as a slot for a communication link with a TDMA/TDD method to a base transceiver station. When the dispatch for urgent occurs as a slot for a communication link from another telephone connected with said cable during 4 slot activity When the communication link of one slot is terminated among four slots in use and it is under activity by using as a communication link slot the slot of the number which usually assigns as a slot for control and is, The slot control means for a communication link which notifies the change request of a communication link slot in use to a base transceiver station, After performing the connection request for urgent to a base transceiver station using the slot for control furthermore made intact by modification of said slot, The fixed telephone subscriber unit of the wireless local loop system characterized by having had the urgent dispatch control means which changes the slot for control into the slot for a communication link, and is used for urgent dispatch, and enabling urgent dispatch also in an activity as a slot for an a maximum of 4 slot communication link.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] About the fixed telephone subscriber unit of a wireless local loop system, this invention connects two or more telephones to one set especially of FSU, and relates to the wireless local loop system which can be talked over the telephone simultaneous, and its fixed telephone subscriber unit.

[0002]

[Description of the Prior Art] In the location in which the wire telephone line network is installed by neither ordinary homes nor the entrepreneur in overseas, especially a developing country recently Instead of a wire telephone circuit and a common-name metal wire [whether a base transceiver station is installed in a dial office, and] Or install a base transceiver station near the dial office, and a dial office and a base transceiver station [whether it connects by the wire circuit, and] Or the fixed telephone subscriber unit which connects by the wireless circuit and can connect telephone to ordinary homes or a business within a station further, A common name FSU (Fixed Subscriber Unit) By installing (it is hereafter called FSU) and connecting on radio the base transceiver station and FSU which are connected by the dial office, the wireless circuit, or the wire circuit instead of a metal wire A communication mode called the wireless local loop (Wireless Local Loop) aiming at enabling it to use telephone by ordinary homes or the business within a station and a common-name WLL (henceforth WLL) system is devised.

[0003] Hereafter, the above-mentioned conventional WLL system is explained with reference to drawing 24 , drawing 25 , drawing 26 , drawing 27 , drawing 28 , drawing 29 , and drawing 30 . Drawing 24 is the conventional example of the WLL structure of a system, and is drawing showing the whole WLL structure of a system which can carry out the gestalt of each operation of this invention. Here, the example of the WLL structure of a system in ordinary homes is shown. In drawing 24 , FSU by which 2401 was installed in the house of ordinary homes and 2402 was installed in general domestic, the telephone by which 2403 is connected to FSU through a telephone cord, and 2404 are antennas of FSU generally installed out of a house.

[0004] Moreover, 2405 is FSU and a base transceiver station which performs radiocommunication, and is installed out of the dial office in the example of drawing 24 . 2406 is the antenna of a base transceiver station and 2407 is a stanchion which installs a base transceiver station 2405 and an antenna 2406. The base transceiver station 2405 is connected with the base transceiver station management equipment 2409 in a dial office 2408 through the cable cable. 2410 shows the whole high order network, common-name network network, or telephone network of a dial office.

[0005] Next, the example of a configuration of FSU is explained with reference to drawing 25 . Drawing 25 is the block diagram showing the configuration of FSU shown in drawing 24 . In drawing 25 , 2501 is an antenna connector, and since the antenna of FSU is usually installed in the outdoors, it is a connector for connecting the cable of an antenna. 2502 is a wireless circuit. The wireless circuit 2502 transmits and receives wireless data, receiving directions of a frequency and transceiver timing from the radio control section 2503. 2502A is a synthesizer which generates the signalling frequency which was built in the wireless circuit 2502 and specified by the radio control section 2503.

[0006] Moreover, the radio control section which writes in the receiving level data which 2503 measured receiving level from the wireless data of the received base transceiver station, and were measured in the memory memory in a control section 2505, 2504 is the channel codec section which performs the assembly of data and decomposition which are transmitted and received by the channel for control and the channel for a communication link of wireless. The data of the channel for a communication link consist of information, such

as voice, and control information processed by the control section 2505, and signal processing is performed by the voice codec in the telephone-line interface section 2507, without user data, such as voice, minding a control section 2505.

[0007] Moreover, it is the memory which has memorized information required in order that 2506 may catch an employment base transceiver station etc., and a nonvolatile memory is used in many cases. 2507 is the telephone-line interface section which consists of a voice codec circuit, a telephone-line circuit, a terminating signal generating circuit, a telephone off-hook detector, a telephone dial detector, etc. As for the telephone code connector which connects the telephone cord of the telephone which connects 2508 to FSU, and 2509, a power circuit and 2510 are power cords.

[0008] Next, with reference to drawing 26, the example of a configuration of a base transceiver station is explained. Drawing 26 is the block diagram showing the configuration of the base transceiver station shown in drawing 24. In drawing 26, 2601 is an antenna and 2602 is a wireless circuit. The wireless circuit 2602 transmits and receives wireless data, receiving directions of a frequency and transceiver timing from the radio control section 2603. 2602A is a synthesizer which generates the frequency which was built in the wireless circuit 2602 and specified by the radio control section 2603. 2603 is the radio control section and writes in the receiving level data which measured receiving level from the wireless data of the received base transceiver station, and were measured in the memory memory in a control section 2605.

[0009] Moreover, 2604 is the channel codec section and performs the assembly of data and decomposition which have been transmitted and received by the control channel and the channel for a communication link of wireless. 2606 is memory information required at the time of employment, i.e., ID etc., is remembered to be, and a nonvolatile memory is used in many cases. 2607 is the interface section between network sides, such as base station management equipment. As for a network connector and 2609, 2608 is [a power circuit and 2610] power cords.

[0010] Next, based on drawing 24, drawing 25, and drawing 26, WLL adapting the personal handy phone or PHS of a TDMA/TDD method is taken for an example, for example, the telephone of ordinary homes is used, and it explains briefly what dispatch, arrival, and a call can be performed with a WLL method.

[0011] As for the base transceiver station 2405, in the case of WLL, in drawing 24, the case of an opposite station, i.e., the usual PHS system, has usually transmitted [be / it / under / communication link standby / setting] the information signal of a fixed period called LCCH (logic-control channel) to FSU to a mobile station (common name PS) like a general PHS public base station.

[0012] Next, with reference to drawing 26, the actuation whose base transceiver station 2405 (drawing 24) transmits LCCH is explained. After inserting the power cord 2610 in the plug socket, switching on a power source, starting the base station management equipment interface section by the control section 2605 of a base transceiver station, and downloading required information from base transceiver station management equipment 2409 (drawing 24), and a control section 2605 controls the channel codec section 2604 and the radio control section 2603 and sets the predetermined frequency for control as synthesizer 2602A, LCCH is periodically transmitted from the wireless circuit 2602.

[0013] Next, actuation of FSU is explained with reference to drawing 25. FSU2402 (drawing 24) receives LCCH of the base transceiver station corresponding to the base transceiver station information registered into the memory 2506 of FSU after powering on (i.e., after a power circuit 2509 supplies a power source to each part by inserting the plug of a power cord 2510 in a plug socket). The base transceiver station information registered into FSU described here is the carrier (frequency) number of LCCH which a base transceiver station transmits, the carrier number for common-name control and the entrepreneur identification code of a base transceiver station, a common-name system ID, etc.

[0014] That is, after setting up the frequency which is equivalent to the carrier number for control through the radio control section 2503 at SHINSEI sizer 2502A by control of a control section 2505 based on the information registered into the memory 2506 behind powering on and in FSU, FSU lets the channel codec section 2504 pass by control of a control section 2505, makes the wireless circuit 2502 a continuous-reception condition, and it searches LCCH of the base transceiver station which is in agreement with the system ID registered into memory 2506.

[0015] Next, the burst configuration of LCCH is explained with reference to drawing 27. Drawing 27 is RCR which is the standard of PHS. It is the burst block diagram of LCCH which the base transceiver station currently used on the carrier for control of PHS specified by STD-28 transmits. In drawing 27, the 42-bit base

transceiver station ID is in unique WORD for PR to take a preamble and for UW take a synchronization and after that, and 9 bits of a head are equivalent to a system ID among 42 bits. Control information and CRC information continue behind a base transceiver station ID.

[0016] Next, the flow of a location registration sequence is explained with reference to drawing 28 . Drawing 28 is RCR. It is drawing showing the location registration sequence over a base transceiver station simple from FSU specified to STD-28. While FSU (2402 of drawing 24) is searching LCCH of a base transceiver station 2405 When in agreement with the system ID by which 9 bits (system ID) of heads of the base transceiver station ID in LCCH are registered into the memory 2506 of FSU The base transceiver station concerned is caught by the channel codec section 2504 by control of a control section 2505. FSU is RCR like the mobile station of the usual PHS. After exchanging the exchange of the location registration sequence specified by STD-28, i.e., the link channel establishment on a control channel, FSU and a base transceiver station shift to the channel for a communication link.

[0017] If it shifts to the channel for a communication link, in order of the layer 1 specified by OSI of ISO, a layer 2, and a layer 3, by control of a control section 2505 and the channel codec section 2504, by control of a control section 2605 and the channel codec section 2604, FSU will await a base transceiver station, after carrying out on a wireless circuit, and will go the operating sequence between FSU and a base transceiver station into a condition. By performing location registration, the positional information of FSU can be sent to a dial office side from a base transceiver station, and FSU can receive arrival of the mail now after that. The information on location registration is transmitted to base station management equipment (2409) from a base transceiver station (2405 of drawing 24).

[0018] Next, the flow of a package dispatch sequence is explained with reference to drawing 29 . Drawing 29 is RCR. It is drawing showing the dispatch sequence between the telephone based on the package dispatch sequence specified by STD-28, FSU, and a base transceiver station simple. After location registration, if the telephone (2403 of drawing 24) connected to FSU carries out off-hook, FSU will detect the off-hook signal from telephone 2403 by the control section 2505 through the telephone-line interface section 2507 of drawing 25 . If an off-hook signal is detected, by control of a control section 2505, FSU will start the dial tone sending-out circuit in the telephone-line interface section 2507, and will output a dial tone to telephone 2403.

[0019] By hearing a dial tone, a user does the depression of the dial of telephone. FSU detects the dial from telephone 2403 by the control section 2505 through the telephone-line interface section 2507. Then, about the fixed waiting timer for a dial input, a control section 2505 is RCR, when a time-out is carried out, a flare and. The sequence of the package dispatch specified by STD-28 is exchanged. That is, like the sequence of location registration, in a control channel, a link channel establishment demand message is transmitted to a base transceiver station by control of the control section 2505 of FSU, FSU is performed by a control section 2505 and the channel codec section 2504, and a base transceiver station is first performed by a control section 2605 and the channel codec section 2604 in the control in which FSU and a base transceiver station were made for FSU to shift to a message channel after receiving a link channel allocation message from the base transceiver station.

[0020] Then, FSU is the same and a base transceiver station establishes the sequence between FSU and a base transceiver station in order of a layer 1 and a layer 2 in a message channel by control of a control section 2605 and the channel codec section 2604 by the control section 2505 and the channel codec section 2504. In establishment of the sequence of a layer 3 FSU then, by the control section 2505 and the channel codec section 2504 A base transceiver station by the control section 2605 and the channel codec section 2604 When the exchange of the introduction call setup message and a call setup reception message is performed on a wireless circuit, next a base transceiver station receives a call message from base transceiver station management equipment (2409 of drawing 24) After controlling the control section 2605 of a base transceiver station to create a call message to the channel codec section 2604, it transmits a call message to FSU.

[0021] If FSU checks that the control section 2505 has received the call message from a base transceiver station through the wireless circuit 2502 and the channel codec section 2504, a control section 2505 can turn on the ADPCM codec section of the telephone-line interface section 2507, and can hear to telephone the sound (a ring back tone, common name RBT) which is calling the partner who outputs from a dial office side through a base transceiver station and FSU. By it, a user can telephone to a partner with telephone, after waiting and a partner telephone answer that a partner telephone place answers.

[0022] Next, with reference to drawing 30 , the flow of arrival and an arrival-of-the-mail response sequence is

explained. Drawing 30 is RCR. It is drawing showing the arrival-of-the-mail sequence over FSU (2402 of drawing 24), and telephone simple from the base transceiver station (2405 of drawing 24) based on the arrival-of-the-mail sequence specified by STD-28. When there is arrival of the mail from a partner, a base transceiver station 2405 receives the arrival-of-the-mail information from base transceiver station management equipment 2409 first. The control section 2605 of a base transceiver station 2405 is controlled to set a signal with arrival of the mail to the channel codec section 2604.

[0023] Then, a message with a call in is transmitted to FSU (2402 of drawing 24) from the wireless circuit 2602 of a base transceiver station to the timing of LCCH, and he is RCR between a base transceiver station and FSU like the above-mentioned location registration or the sequence of dispatch henceforth. The arrival-of-the-mail sequence specified by STD-28 is exchanged. That is, FSU(s) are a control section 2505 and the channel codec section 2504, and a base transceiver station performs the exchange in a control section 2605 and the channel codec section 2604.

[0024] If FSU succeeds in an arrival-of-the-mail sequence, it will start the terminating signal generating circuit in the telephone-line interface section 2507 by control of a control section 2505, will send out a terminating signal to telephone 2403, and will carry out [sound / of telephone 2403 / ringer] singing. By this, a telephone user can know that there was arrival of the mail.

[0025] In an arrival-of-the-mail condition, when a user does off-hook [of the telephone], the control section 2505 of FSU detects the off-hook signal from telephone 3 through the telephone-line interface section 2507, lets the channel codec section 2504 and the wireless circuit 2502 pass by control of a control section 2505, and transmits a response message by wireless to a base transceiver station 2405. If a control section 2605 receives the response message from FSU through the wireless circuit 2602 and the channel codec section 2604, by control of a control section 2605, a base transceiver station 2405 will start the channel codec section 2604, and will transmit a response acknowledgement message from the wireless circuit 2602 to FSU. If the control section 2505 of FSU receives a response acknowledgement message through the wireless circuit 2502 and the channel codec section 2504, an arrival-of-the-mail response is materialized and a user can telephone to a partner with telephone 2403.

[Problem(s) to be Solved by the Invention]

[0026] However, there was one telephone connectable with FSU in the above-mentioned conventional WLL system, there were many set-type residences in the developing country by whom especially the need of a WLL system is expected, it had to install FSU in all the doors that are in demand even when installing FSU in a set-type residence, when the total cost which builds a WLL system increased, it took time in installation, and it had the problem were inefficient.

[0027] It is what was made in order that this invention might solve the above-mentioned conventional problem. Between base transceiver stations at the time of wireless connection initiation The inside of four slots of FSU, The slot number [a base transceiver station] to assign as a slot for a communication link is notified to a base transceiver station. As the same slot of the TDMA/TDD time slot seen from FSU was not used in piles as a slot for a communication link of other telephones, when it was made to enable the simultaneous call of two or more telephones Two or more telephones are connected to one set of FSU, the number of FSU is reduced, and it sets it as the 1st object to offer FSU of the WLL system which can make the minimum the configuration of the wireless section and the control section which are used there.

[0028] Moreover, this invention sets it as the 2nd object to offer FSU of the WLL system which each slot can notify the condition of under an activity or saying whether it is intact as a slot for a communication link to a base transceiver station among four slots of FSU between base transceiver stations at the time of wireless connection initiation, and I can have assigned from a base transceiver station by using an intact slot as the slot for a communication link.

[0029] Moreover, this invention sets it as the 3rd object to offer FSU of the WLL system which can notify the slot number of the channel for a modification place communication link from the FSU side, when a slot in use transmits the channel change-request message for a communication link which requires modification of other channels to a base transceiver station from FSU as a slot for a communication link for the interference from other radio stations etc.

[0030] A slot in use this invention as a slot for a communication link Moreover, the interference from other radio stations etc. sake, When FSU transmits the channel change-request message for a communication link which requires modification of other channels to a base transceiver station Or the condition of saying whether it

is intact is notified to a base transceiver station. the inside of four slots of FSU, and each slot -- as the slot for a communication link -- under an activity -- It sets it as the 4th object to offer FSU of the WLL system which I can have directed from a base transceiver station by using an intact slot as a change place slot.

[0031] Moreover, this invention sets it as the 5th object to offer the WLL system which can make possible location registration of all the telephone numbers connected to FSU by one location registration.

[0032] Moreover, this invention sets it as the 6th object to offer the WLL system which can tell base transceiver station management equipment about being the location registration from FSU which can connect two or more telephones by having a specific number as FSU which can connect two or more telephones apart from the telephone number corresponding to two or more telephones, and transmitting this specific number to base transceiver station management equipment.

[0033] Moreover, in FSU which can connect two or more telephones, this invention makes 4 figures the same value under two or more telephone numbers corresponding to each telephone, makes the same about all the telephone numbers timing to which FSU receives an arrival-of-the-mail message on a control channel, and sets it as the 7th object to offer FSU and its arrival-of-the-mail approach of the WLL system by which FSU can perform efficient dc-battery saving.

[0034] Moreover, this invention already sets it as the 8th object that FSU offers the base transceiver station or base transceiver station management equipment of a WLL system which can be prevented from already specifying the slot of the same number as the slot for a communication link in use as a slot for a communication link to FSU at the time of the wireless connection initiation from FSU in a condition in use as a slot for an one or more slot communication link.

[0035] Moreover, this invention sets it as the 9th object to offer the base transceiver station or base transceiver station management equipment of a WLL system which can be prevented from already specifying the slot of the same number as the slot for a communication link in use, when FSU already receives a channel change demand message during a communication link from FSU in a condition in use as a slot for an one or more slot communication link.

[0036] Moreover, this invention is set in the condition that two or more telephones are used one slot as three slots and a slot for control as a slot for a communication link in usable FSU. When it awaits and there is dispatch for urgent from another inner telephone, after terminating the communication link of one slot among three slots currently used as a slot for a communication link It sets it as the 10th object to offer FSU of the WLL system which can use the slot as a communication link slot for urgent dispatch.

[0037] Moreover, this invention makes the time slot usually used as a slot for control the 4th set of message channels. When it enables it to use it also as a slot for a communication link and the number of activities of the slot for a communication link of telephone changes to 3 from 4 Usually, the time slot currently used as a slot for control is used as an intact slot, and it sets it as the 11th object to offer FSU of a WLL system which can revitalize it into the slot for control.

[0038] Moreover, when this invention enables it to use the time slot usually used as a slot for control as a slot for a communication link as the 4th set of message channels and the number for a communication link of telephone of slot activities changes to 3 from 4, In order to double with the slot number of the original slot for control the slot number which uses, carrying out a slot for control When the slot corresponding to the slot number of the slot for control is used by the slot for a communication link It sets it as the 12th object to offer FSU of a WLL system which can revive the slot of the decided number as a slot for control after transmitting a communication link slot change-request message to a base transceiver station from FSU, in order to once make the slot intact.

[0039] Moreover, when four slots of this inventions are awaited when using it as a slot for a communication link, and the dispatch for urgent occurs from another inner telephone, after terminating the communication link of 1 in 4 slots slot By once performing wireless connection initiation of dispatch for urgent for an intact slot as a slot for control, and changing the slot concerned as a slot for a communication link from the slot for control It sets it as the 13th object to offer FSU of the WLL system which can confirm dispatch for urgent.

[0040]

[Means for Solving the Problem] In case this invention transmits a wireless connection-request message to a base transceiver station from the control means which connects two or more telephones, and FSU into FSU in order to attain the 1st object, it establishes the slot assignment means for a communication link into the message at the time of the connection which directs from FSU the slot used as a channel for a communication link.

[0041] As opposed to the 1st object of this invention between base transceiver stations at the time of wireless connection initiation The inside of four slots of FSU, The slot number [a base transceiver station] to assign as a slot for a communication link is notified to a base transceiver station. By having been made to enable the simultaneous call of two or more telephones by one set of FSU, as it did not lap with the slot for a communication link which the telephone whose same slots of the TDMA/TDD time slot seen from FSU are others uses Two or more telephones are connected to one set of FSU, the number of FSU is reduced, and FSU of the WLL system which can make the minimum the configuration of the wireless section and the control section which are used there is obtained.

[0042] This invention establishes the advice means of a slot condition in FSU at the time of the connection for notifying the current busy condition of the time slot of a fixed telephone subscriber unit to a base transceiver station in order to attain the 2nd object.

[0043] As opposed to the 2nd object of this invention between base transceiver stations at the time of wireless connection initiation The inside of four slots of FSU, Each slot notifies the condition of under an activity or saying whether it is intact as a slot for a communication link to a base transceiver station, and assignment is received by using an intact slot as the slot for a communication link from a base transceiver station. By having been made to enable the simultaneous call of two or more telephones by one set of FSU, two or more telephones are connected to one set of FSU, the number of FSU is reduced, and FSU of the WLL system which can make the minimum the configuration of the wireless section and the control section which are used there is obtained.

[0044] When carrying out message sending of the slot change request for a communication link from FSU to a base transceiver station during a communication link, this invention establishes the slot assignment means for a communication link in FSU during the communication link which specifies the slot used as a channel for a communication link from FSU, in order to attain the 3rd object.

[0045] In order that a slot in use may change the channel for a communication link by interference from other radio stations etc. as a slot for a communication link to the 3rd object of this invention, When transmitting the channel change-request message for a communication link to a base transceiver station from FSU By having enabled it to notify the slot number of the channel for a modification place communication link from the FSU side In FSU in which the simultaneous call of two or more telephones is possible at one set, FSU of a WLL system which can realize the change of a channel during a call, without affecting the slot under other communication links is obtained.

[0046] When carrying out message sending of the slot change request for a communication link from FSU to a base transceiver station during a communication link, this invention establishes the advice means of a slot condition in FSU during the communication link which notifies the busy condition of a current time slot from FSU, in order to attain the 4th object.

[0047] In order that, as for this invention, a slot in use may change the channel for a communication link by interference from other radio stations etc. as a slot for a communication link to the 4th object, When FSU transmits the channel change-request message for a communication link to a base transceiver station By each slot notifying the condition of under an activity or saying whether it is intact as a slot for a communication link to a base transceiver station, using an intact slot as a change place slot among four slots of FSU, and having made it have you direct from a base transceiver station In FSU in which the simultaneous call of two or more telephones is possible at one set, FSU of a WLL system which can realize the change of a channel during a call, without affecting the slot under other communication links is obtained.

[0048] This invention establishes the location registration system means whose location registration to the base transceiver station management equipment of two or more telephone numbers registered into FSU becomes possible by one location registration in order to attain the 5th object.

[0049] When this invention was made to perform location registration of FSU into which two or more telephone numbers are registered by one location registration to the 5th object, the wireless local loop system which can perform location registration of all the telephone numbers connected to FSU at a time is obtained.

[0050] This invention by also registering the specific number as FSU into FSU into which two or more telephone numbers are registered, going up the specific number, carrying in a message, and performing location registration in order to attain the 6th object After making it know that it is the location registration from FSU by which two or more telephone numbers are registered into the base transceiver station management equipment side, the location registration system means which makes possible location registration of two or more

telephone numbers of all is established.

[0051] The wireless local loop system which can make it recognize that it is the location registration from FSU which can connect two or more telephones to base transceiver station management equipment when this invention has a specific number as FSU which can connect two or more telephones to the 6th object especially apart from the telephone number corresponding to two or more telephones and transmitted this specific number to base transceiver station management equipment is obtained.

[0052] Since this invention attains the 7th object, it makes 4 figures the same value under two or more telephone numbers registered into FSU, and can be made to perform arrival to all the telephone numbers registered in the control channel which receives the terminating signal of the same arrival-of-the-mail group of the slot for control.

[0053] In FSU to which this invention can connect two or more telephones to the 7th object Make 4 figures into the same value under two or more telephone numbers corresponding to each telephone, and timing to which FSU receives an arrival-of-the-mail message on a control channel is made the same with all the telephone numbers. By awaiting also by FSU which has two or more telephone numbers, and having enabled it to make the period of dc-battery saving at the time into the same period as FSU which has only the one telephone number FSU and its arrival-of-the-mail approach of the WLL system which can perform efficient dc-battery saving also by FSU which has two or more telephone numbers are acquired.

[0054] After it receives the wireless connection request from FSU, this invention establishes a slot distribution means in a base transceiver station or base transceiver station management equipment at the time of the connection it is made not to specify a slot in use and the slot of the same number as a slot for a communication link by FSU actually, in order to attain the 8th object.

[0055] FSU already sets this invention in the condition in use as a slot for an one or more slot communication link to the 8th object. By making it not already specify the slot of the same number as the slot for a communication link in use as a slot for a communication link to FSU at the time of the wireless connection initiation from FSU Without specifying a slot using from FSU or notifying the condition of a slot The base transceiver station or base transceiver station management equipment of a wireless local loop system which a high order side can assign an intact slot to FSU which has two or more telephone numbers is obtained.

[0056] After it receives the channel change request for a communication link of the slot under communication link from FSU, this invention establishes a slot distribution means in a base transceiver station or base transceiver station management equipment during the communication link controlled not to specify a slot in use and the slot of the same number as a slot for a communication link by FSU, in order to attain the 9th object.

[0057] FSU already sets this invention in the condition in use as a slot for an one or more slot communication link to the 9th object. When a channel change demand message is received during a communication link from FSU, by making it not already specify the slot of the same number as the slot for a communication link in use The base transceiver station or base transceiver station management equipment of a wireless local loop system which can assign an intact slot in the change of a channel to FSU which has two or more telephone numbers during a communication link is obtained.

[0058] In order to attain the 10th object, in FSU, this invention uses three slots as the slot for a communication link, and when the dispatch for urgent awaits and it generates from inner telephone while in use, it establishes the urgent dispatch control means which uses one slot of the three slots for the dispatch for urgent by using one slot as the slot for control.

[0059] This invention is set to FSU with two or more usable telephones to the 10th object. In the condition that one slot is used as three slots and a slot for control as a slot for a communication link When it awaits and there is dispatch for urgent from another inner telephone, after terminating the communication link of one slot among three slots currently used as a slot for a communication link FSU which has two or more telephone numbers by having enabled it to use the slot as a communication link slot for urgent dispatch -- setting -- all the slots for a communication link -- FSU of the WLL system which can respond to the dispatch for urgent also in an activity is obtained.

[0060] This invention establishes the slot control means for control for using a maximum of four slots of slots for a communication link within FSU in order to attain the 11th object.

[0061] This invention enables it to use the time slot usually used as a slot for control also for the slot for a communication link as the 4th set of message channels to the 11th object. And when the number of activities of the slot for a communication link of telephone changes to 3 from 4 usually, the thing for which use as an intact

slot the time slot currently used as a slot for control, and it enabled it to revitalize it into the slot for control -- one TDMA/TDD frame -- the maximum coincidence -- 4 call **** -- FSU of the WLL system which can do things is obtained.

[0062] This invention establishes the slot control means for a communication link which used the slot of the defined slot number as a slot for control, when the slot for a communication link turns into three or less slots after enabling it to use a maximum of four slots of slots for a communication link in FSU in order to attain the 12th object.

[0063] This invention enables it to use the time slot usually used as a slot for control also as a slot for a communication link of the 4th set of message channels to the 12th object. When the number for a communication link of telephone of slot activities changes to 3 from 4 after that In order to double with the slot number of the original slot for control the slot number which uses, carrying out a slot for control, when using it for a communication link with the slot number of the slot for control By having enabled it to revive the slot number defined as an object for control as a slot for control, after transmitting a communication link slot change-request message to a base transceiver station from FSU, in order to once make the slot intact After coincidence 4 call, when one call is completed, FSU of a WLL system which can make it possible to receive the signal of the control channel of the original base transceiver station is obtained.

[0064] After enabling it to use a maximum of four slots of slots for a communication link within FSU, when the dispatch for urgent awaits and it generates from inner telephone, this invention establishes the urgent dispatch control means which uses one slot of the four slots for the dispatch for urgent, in order to attain the 13th object.

[0065] When four slots of this inventions are awaited to the 13th object when using it as a slot for a communication link, and the dispatch for urgent occurs from another inner telephone After terminating the communication link of one slot among four slots, the wireless connection which once sends the intact slot to urgent as a slot for control is started. By having changed the slot into the slot for a communication link from the slot for control, FSU of a WLL system which can perform dispatch for urgent is obtained also in the condition of coincidence 4 call.

[0066]

[Embodiment of the Invention] The fixed telephone subscriber unit in invention of this invention according to claim 1 It connects by base transceiver station management equipment, and the base transceiver station and wireless by which it connected with the cable and 1 or two or more telephones were connected to the telephone network. The control means which is the fixed telephone subscriber unit of the wireless local loop system which communicates with TDMA / TDD method, and controls connection of two or more telephones, When starting a communication link to said base transceiver station from the telephone connected with said cable It has a slot assignment means for a communication link at the time of the connection which specifies the slot for a communication link used from a fixed telephone subscriber unit as a channel for a communication link to a base transceiver station. By making it the slot which two or more telephones use not lap, and having been made to enable the simultaneous call of two or more telephones by one set of FSU, using TDMA / TDD slot efficiently The number of FSU is reduced and it has an operation that the configuration of the wireless section and the control section which are used there can be made into the minimum.

[0067] The fixed telephone subscriber unit in invention of this invention according to claim 2 It connects by base transceiver station management equipment, and the base transceiver station and wireless by which it connected with the cable and 1 or two or more telephones were connected to the telephone network. The control means which is the fixed telephone subscriber unit of the wireless local loop system which communicates with TDMA / TDD method, and controls connection of two or more telephones, When starting a communication link to said base transceiver station from the telephone connected with said cable It has an advice means of a slot condition at the time of the connection which notifies the current busy condition of the TDMA/TDD slot in said fixed telephone subscriber unit. According to advice of the busy condition of said slot, receive assignment by using an intact slot as the slot for a communication link from a base transceiver station, and a TDMA/TDD slot is used efficiently. By having been made to enable the simultaneous call of two or more telephones by one set of FSU, the number of FSU is reduced and it has an operation that the configuration of the wireless section and the control section which are used there can be made into the minimum.

[0068] The fixed telephone subscriber unit in invention of this invention according to claim 3 When said control means judged, that communication link quality deteriorated during the communication link between said fixed telephone subscriber units and base transceiver stations When transmitting the channel change-request message

for a communication link from said fixed telephone subscriber unit to a base transceiver station Have a slot assignment means for a communication link during the communication link which specifies the slot for a communication link which a fixed telephone subscriber unit uses as a channel for a communication link, and the simultaneous call of two or more telephones sets to possible FSU by one set. It has an operation that the change of a message channel is realizable, without after the change of a message channel affecting the slot under other communication links by asynchronous interference etc.

[0069] The fixed telephone subscriber unit in invention of this invention according to claim 4 When said control means judged, that communication link quality deteriorated during the communication link between said fixed telephone subscriber units and base transceiver stations When transmitting the channel change-request message for a communication link from said fixed telephone subscriber unit to a base transceiver station It has an advice means of a slot condition during the communication link which notifies the current busy condition of the TDMA/TDD slot in a fixed telephone subscriber unit. It has an operation that the change of a message channel is realizable, without after a message channel change affecting other message channels by asynchronous interference etc.

[0070] The wireless local loop system in invention of this invention according to claim 5 It has a fixed telephone subscriber unit according to claim 1 or 2 and base transceiver station management equipment connected to the telephone network. Said fixed telephone subscriber unit holds the telephone number of two or more telephones connected. It has the location registration system means which carries out location registration of said two or more telephone numbers of all by 1 time of the location registration demand message to base transceiver station management equipment. Said base transceiver station management equipment is equipped with a location registration system means to recognize all the telephone numbers received from said fixed telephone subscriber unit to be the telephone number registered into one fixed telephone subscriber unit, and to process. It has an operation that the location registration to the base transceiver station management equipment of two or more telephone numbers registered into FSU can be substituted for one location registration by FSU.

[0071] The wireless local loop system in invention of this invention according to claim 6 It has a fixed telephone subscriber unit according to claim 1 or 2 and base transceiver station management equipment connected to the telephone network. Said fixed telephone subscriber unit holds the telephone number of two or more telephones connected. Apart from the telephone number of each of said telephone, it has a specific number as a fixed telephone subscriber unit. It has the location registration system means which carries and carries out location registration of said specific number to a location registration demand message. It has a location registration system means to recognize it as said base transceiver station management equipment being the location registration to two or more telephone numbers of all registered into said fixed telephone subscriber unit by the specific number received from said fixed telephone subscriber unit. While being able to substitute for one location registration by FSU the location registration to the base transceiver station management equipment of two or more telephone numbers registered into FSU It has the operation of the ability to make it recognize that it is the location registration from FSU which can connect two or more telephones to base transceiver station management equipment.

[0072] The fixed telephone subscriber unit in invention of this invention according to claim 7 By making 4 figures into the same value under two or more telephone numbers corresponding to 1 or two or more telephones which are connected with said cable, and performing location registration The arrival-of-the-mail message to all the telephones connected to the fixed telephone subscriber unit It is made to receive by the channel which is equivalent to the same arrival group in the message for control which a base transceiver station transmits, and even if it is FSU which has two or more telephone numbers, it has an operation that the same dc-battery saving as FSU which has the single telephone number can be performed.

[0073] The arrival-of-the-mail approach of the fixed telephone subscriber unit in invention of this invention according to claim 8 Make 4 figures into the same value under the telephone number of two or more telephones connected to one fixed telephone subscriber unit, and location registration is performed to a base transceiver station. It is made to consist of each process which receives the arrival-of-the-mail message to all the telephones connected to the fixed telephone subscriber unit by the channel which is equivalent to the same arrival group in the message for control which transmits from a base transceiver station. Even if it is FSU which has two or more telephone numbers, it has an operation that the same dc-battery saving as FSU which has the single telephone number can be performed.

[0074] The base transceiver station in invention of this invention according to claim 9 It is the base transceiver

station of the wireless local loop system connected with the fixed telephone subscriber unit to which it connects with a telephone network and 1 or two or more telephones are connected with the cable on radio by the TDMA/TDD method. When dispatch or arrival new when said fixed telephone subscriber unit has already used it as a slot for the one or more slot communication link in 4 slots arises based on the information on said fixed telephone subscriber unit, It has a slot distribution means at the time of the connection controlled not to specify the slot of the same number as a slot for a communication link. By assigning an intact slot from a high order side to FSU which has two or more telephone numbers, without specifying a slot using from FSU or notifying the condition of a slot It has an operation that two or more simultaneous call in FSU is realizable, using a TDMA/TDD slot efficiently.

[0075] The base transceiver station management equipment in invention of this invention according to claim 10 It is base transceiver station management equipment connected through the base transceiver station connected with the fixed telephone subscriber unit to which it connects with a telephone network and 1 or two or more telephones are connected with the cable on radio by the TDMA/TDD method. When dispatch or arrival new when said fixed telephone subscriber unit has already used it as a slot for the one or more slot communication link in 4 slots arises based on the information on said fixed telephone subscriber unit, It has a slot distribution means at the time of the connection controlled not to specify the slot of the same number as a slot for a communication link. By assigning an intact slot from a high order side to FSU which has two or more telephone numbers, without specifying a slot using from FSU or notifying the condition of a slot It has an operation that two or more simultaneous call in FSU is realizable, using a TDMA/TDD slot efficiently.

[0076] The base transceiver station in invention of this invention according to claim 11 It is the base transceiver station of the wireless local loop system connected with the fixed telephone subscriber unit to which it connects with a telephone network and 1 or two or more telephones are connected with the cable on radio by the TDMA/TDD method. When the fixed telephone subscriber unit has already used it based on the information on said fixed telephone subscriber unit as a slot for the two or more slot communication link in 4 slots When the control means of said fixed telephone subscriber unit judged with communication link quality having deteriorated When said base transceiver station receives the channel change-request message for a communication link from said fixed telephone subscriber unit Have a slot distribution means during the communication link controlled to specify the intact slot number which other telephones have not already used as a channel for modification, and it sets to the change of a channel during a communication link. Are not from the FSU side and by assignment from a high order side by assigning an intact slot to FSU which has two or more telephone numbers It has an operation that a message channel change is realizable, without after a message channel change affecting other message channels by asynchronous interference etc.

[0077] The base transceiver station management equipment in invention of this invention according to claim 12 It is base transceiver station management equipment connected through the base transceiver station connected with the fixed telephone subscriber unit to which it connects with a telephone network and 1 or two or more telephones are connected with the cable on radio by the TDMA/TDD method. When the fixed telephone subscriber unit has already used it based on the information on said fixed telephone subscriber unit as a slot for the two or more slot communication link in 4 slots When the control means of said fixed telephone subscriber unit judged with communication link quality having deteriorated When said base transceiver station management equipment receives the channel change-request message for a communication link from said fixed telephone subscriber unit Have a slot distribution means during the communication link controlled to specify the intact slot number which other telephones have not already used as a channel for modification, and it sets to the change of a channel during a communication link. Are not from the FSU side and by assignment from a high order side by assigning an intact slot to FSU which has two or more telephone numbers It has an operation that a message channel change is realizable, without after a message channel change affecting other message channels by asynchronous interference etc.

[0078] The fixed telephone subscriber unit in invention of this invention according to claim 13 It connects on radio with the base transceiver station and TDMA/TDD method which were connected to the telephone network. It is the fixed telephone subscriber unit of the wireless local loop system to which 1 or two or more telephones are connected with the cable. While establishing the control means which connects two or more telephones and using one slot as three slots and a slot for control as a slot for a communication link in the case of said one fixed telephone subscriber unit When the dispatch for urgent occurs from said another telephone connected, as a slot for a communication link The inside of three slots in use, FSU which is made to end the

communication link of one slot, is equipped with the urgent dispatch control means which assigns the slot as a slot for urgent dispatch, and has two or more telephone numbers -- setting -- all the slots for a communication link -- it has an operation that urgent dispatch is realizable also in an activity.

[0079] The fixed telephone subscriber unit in invention of this invention according to claim 14 When using all four slots as a slot for a communication link, stop the slot for control and a maximum of four telephones enable the call to the same time amount. It has the slot control means for control controlled to revive said stopped slot for control when the slot for a communication link turns into three or less slots. In the WLL system of the TDMA/TDD method which has a maximum of 4 slots, realizing the simultaneous call for several maximum slot minutes has the operation of *****.

[0080] The fixed telephone subscriber unit in invention of this invention according to claim 15 When a slot in use turns into three slots from four slots as a slot for a communication link Usually, when the slot currently assigned as a slot for control is using it as a communication link slot, It has the slot control means for a communication link which notifies the change request of a communication link slot in use to a base transceiver station. Usually, it is made to revitalize the slot currently assigned as a slot for control as a slot for control, and has an operation that the simultaneous call for several maximum slot minutes is realizable, in the WLL system of the TDMA/TDD method which has a maximum of 4 slots.

[0081] The fixed telephone subscriber unit in invention of this invention according to claim 16 The control means which controls two or more telephones connected with the cable is established in one case. It is the fixed telephone subscriber unit of the wireless local loop which enabled it to communicate a maximum of four slots as a slot for a communication link with a TDMA/TDD method to a base transceiver station. When the dispatch for urgent occurs as a slot for a communication link from another telephone connected with said cable during 4 slot activity When the communication link of one slot is terminated among four slots in use and it is under activity by using as a communication link slot the slot of the number which usually assigns as a slot for control and is, The slot control means for a communication link which notifies the change request of a communication link slot in use to a base transceiver station, After performing the connection request for urgent to a base transceiver station using the slot for control furthermore made intact by modification of said slot, It has the urgent dispatch control means which changes the slot for control into the slot for a communication link, and is used for urgent dispatch. In the WLL system of the TDMA/TDD method which is made to enable urgent dispatch and has a maximum of 4 slots also in an activity as a slot for an a maximum of 4 slot communication link While the simultaneous call for several maximum slot minutes is realizable, it has an operation that the urgent dispatch from another telephone is realizable at the time of two or more simultaneous call.

[0082] Hereafter, the gestalt of operation of this invention is explained to a detail based on an accompanying drawing, drawing 1 , or drawing 24 .

(Gestalt 1 of operation) With reference to drawing 1 thru/or drawing 3 , FSU in the gestalt 1 of operation of this invention is explained first. The block diagram showing the configuration [in / in drawing 1 / the gestalt 1 of operation of this invention] of FSU, drawing showing the wireless connection sequence by actuation of FSU which shows drawing 2 to drawing 1 , and drawing 3 are drawings showing the configuration of the TDMA/TDD frame used with the gestalt 1 of this operation.

[0083] Next, with reference to drawing 1 , the configuration of FSU in the gestalt 1 of operation of this invention is explained. In addition, drawing showing the whole WLL structure of a system shown in drawing 24 is referred to in explanation of the gestalt 1 of this operation, and the gestalt of all the following operations. FSU shown in drawing 1 can apply the gestalt 1 of this operation to FSU2402 shown in drawing 24 .

[0084] In drawing 1 , 101 is an antenna connector, and since the antenna of FSU is usually installed in the outdoors, it is a connector for connecting the cable of an antenna. 102 is a wireless circuit. The wireless circuit 102 transmits and receives wireless data, receiving directions of a frequency and transceiver timing from the radio control section 103. 102A is a synthesizer which generates the signalling frequency which was built in the wireless circuit 102 and specified by the radio control section 103.

[0085] The radio control section which writes in the receiving level data which 103 measured receiving level from the wireless data of the received base transceiver station, and were measured in the memory memory in a control section 105 and 104 [moreover,] It is the channel codec section which performs the assembly of data and decomposition which are transmitted and received by the channel for control and the channel for a communication link of wireless. The data of the channel for a communication link consist of information, such as voice, and control information processed by the control section 105, and signal processing is performed by

the voice codec in the telephone-line interface section 107, without user data, such as voice, minding a control section 105. Moreover, 105A is a slot assignment means for a communication link at the time of the connection with which the control section 105 was equipped.

[0086] Moreover, it is the memory which has memorized information required in order that 106 may catch an employment base transceiver station etc., and a nonvolatile memory is used in many cases. 107 is the telephone-line interface section which consists of a voice codec circuit, a telephone-line circuit, a terminating signal generating circuit, a telephone off-hook detector, a telephone dial detector, etc. As for the telephone code connector which connects the telephone cord of the telephone which connects 108 to FSU, and 109, a power circuit and 110 are power cords. In addition, the configuration section shown with each signs 101-110 of above-mentioned drawing 1 corresponds to the configuration section shown with each signs 2501-2510 of drawing 25 to the conventional technique.

[0087] Next, with reference to drawing 2, the wireless connection sequence which is actuation of FSU in the gestalt 1 of operation of this invention is explained. A wireless connection sequence is roughly divided and is divided into three, a dispatch sequence, an arrival-of-the-mail sequence, and a location registration sequence. Hereafter, with reference to drawing 1 and drawing 2, a dispatch sequence is explained to an example for actuation of the gestalt 1 of this operation. First, the telephone code connector 108 and the telephone-line interface section 107 are minded. If the control section 105 of FSU detects the off-hook condition of the telephone connected to FSU, while a control section 105 will start the sound-source generating circuit in the telephone-line interface section 107 and outputting a dial tone to telephone. The channel codec section 104 and the radio control section 103 are controlled, the wireless circuit 102 and synthesizer 102A are operated, and the wireless connection sequence for sending to a base transceiver station is started.

[0088] In this wireless connection sequence, slot assignment means 105A for a communication link notifies the slot which has a wireless connection-request message specified from the FSU side as delivery and a slot for a communication link to a base transceiver station at the time of the connection which it had in the control section 105.

[0089] Hereafter, with reference to drawing 3, it explains why I need to have you specify as a slot for a communication link. Drawing 3 is drawing showing the TDMA/TDD frame currently used by the Personal Handyphone System (PHS) currently used in for example, Japan, Thailand, etc.

[0090] In the example shown in drawing 3, it is drawing of a TDMA/TDD frame seen from the FSU side which can register two or more telephones, and suppose that it is in the condition that the 3rd slot and the 4th slot are used as a communication link slot. And the 1st slot shall be used as only for [for control] slots. The wireless connection-request message containing the slot assignment informative message which specifies [as opposed to / as drawing 2 shows so that a base transceiver station may assign the 2nd slot by slot assignment means 105 for communication link A at the time of connection, since the slot which FSU can use as a slot for a communication link when there is another telephone newly connected to FSU in this condition to dispatch is only the 2nd slot / a base transceiver station] a slot on wireless transmits, and it notifies. The 2nd slot is assigned from a base transceiver station as a slot for a communication link to FSU by this informative message, and the communication link with three sets simultaneous as FSU can be formed in this example.

[0091] (Gestalt 2 of operation) With reference to drawing 4 and drawing 5, FSU in the gestalt 2 of operation of this invention is explained hereafter. The block diagram showing the configuration [in / in drawing 4 / the gestalt 2 of operation of this invention] of FSU and drawing 5 are drawings showing the wireless connection sequence (dispatch sequence) by the actuation of FSU shown in drawing 4.

[0092] First, with reference to drawing 4, the configuration of FSU in the gestalt 2 of operation of this invention is explained. FSU shown in drawing 4 can apply the gestalt 2 of this operation to FSU2402 shown in drawing 24. In drawing 4, 405A is an advice means of a slot condition at the time of the connection with which the control section 405 was equipped. In addition, since the configuration section shown with each signs 401-410 of drawing 4 is equivalent to the configuration section shown with each signs 101-110 of above-mentioned drawing 1, explanation for the second time is omitted.

[0093] Next, with reference to drawing 4 and drawing 5, especially drawing 5, the actuation of FSU in the gestalt 2 of operation of this invention is explained. If the control section 405 of FSU detects the off-hook condition of the telephone connected to FSU through the telephone code connector 408 and the telephone-line interface section 407, a control section 405 will control the channel codec section 404 and the radio control section 403, will operate the wireless circuit 402 and synthesizer 402A, and will start wireless connection while

it starts the sound-source generating circuit in the telephone-line interface section 407 and outputs a dial tone to telephone.

[0094] In this wireless connection sequence, advice means of slot condition 405A notifies the current busy condition of four slots seen from FSU from the FSU side to a base transceiver station at the time of the connection with which the control section 405 was equipped. This message shall be included in a wireless connection-request message as a "slot condition informative message."

[0095] Moreover, the 1st slot carries out to it being used as only for [for control] slots, and the 3rd slot and the 4th slot being already under activity as a slot for a communication link like the gestalt 1 of the above-mentioned implementation. In this condition, when there is newly dispatch from another telephone connected to FSU, the wireless connection-request message containing the slot condition informative message which notifies that slot busy condition is transmitted from FSU to a base transceiver station. That is, in the 1st slot, the 3rd slot and the 4th slot notify during an activity that the 2nd slot is among intact during an activity as slots for a communication link as a control slot to a base transceiver station by advice means of slot condition 405A at the time of connection.

[0096] A base transceiver station assigns the 2nd intact slot from a base transceiver station as a slot for a communication link to FSU with reference to this informative message. Therefore, in this example, that communication link can be formed in three telephones coincidence by one set of FSU.

[0097] under an activity, the 2nd slot, and the 3rd slot are [the 1st slot / under an activity and the 4th slot] moreover, intact [from FSU] as another example, when the 2nd slot and the 3rd slot are intact as slots for a communication link as a slot for control -- thing advice is given. Although this slot condition informative message is the same as that of what is contained in the wireless connection-request message shown in drawing 2 of the dispatch sequence in the gestalt 1 of the above-mentioned implementation, the slot assignment informative message shown in drawing 2 will replace a slot condition informative message in drawing 5 . In the case of this example, from a base transceiver station, either the 2nd intact slot or the 3rd slot is specified by FSU. In this example, the activity of coincidence 2 slot is further attained as FSU.

[0098] (Gestalt 3 of operation) With reference to drawing 6 and drawing 7 , FSU in the gestalt 3 of operation of this invention is explained hereafter. The block diagram showing the configuration [in / in drawing 6 / the gestalt 3 of operation of this invention] of FSU and drawing 7 are drawings showing the communication channel change demand sequence by the actuation of FSU shown in drawing 6 .

[0099] Next, with reference to drawing 6 , the configuration of FSU in the gestalt 3 of operation of this invention is explained. FSU shown in drawing 6 can apply the gestalt 3 of this operation to FSU2402 shown in drawing 24 . In drawing 6 , 605A is a slot assignment means for a communication link during the communication link with which the control section 605 was equipped. In addition, since the configuration section shown with each signs 601-610 of drawing 6 is equivalent to the configuration section shown with each signs 101-110 of above-mentioned drawing 1 , explanation for the second time is omitted.

[0100] Next, with reference to drawing 6 and drawing 7 , especially drawing 7 , the actuation of FSU in the gestalt 3 of operation of this invention is explained. Among a maximum of 3 slots of FSU which can turn into a slot for a communication link, as an example, the 3rd slot and the 4th slot are used as a slot for a communication link, and in the slot under communication link, when the 2nd slot is in an intact condition and the communication link condition of the 3rd slot causes communication link quality degradation by interference etc., the change of the channel for a communication link can be required from FSU from a base transceiver station. The message which requires the change is shown in drawing 7 as a communication channel change demand message. Control of slot assignment means 605A for a communication link notifies it to a base transceiver station by inserting the slot number specifying as FSU in the communication channel change demand message as a "slot assignment informative message" during a communication link.

[0101] By this advice of slot assignment, although a base transceiver station side transmits a communication channel change prompting message to FSU, the slot number directed within that message is made into the slot number specified by FSU. In this example, the change of a channel can be realized during a communication link in FSU which is using two or more slots, without affecting a channel in use to a communication link by the 4th slot, in order to direct that a base transceiver station also changes the channel for a communication link to the 2nd slot to FSU by specifying the 2nd slot from FSU, since it was in the condition that the 2nd slot is intact.

[0102] (Gestalt 4 of operation) With reference to drawing 8 and drawing 9 , FSU in the gestalt 4 of operation of this invention is explained hereafter. The block diagram showing the configuration [in / in drawing 8 / the

gestalt 4 of operation of this invention] of FSU and drawing 9 are drawings showing the communication channel change demand sequence by the actuation of FSU shown in drawing 8 .

[0103] Next, with reference to drawing 8 , the configuration of FSU in the gestalt 4 of operation of this invention is explained. FSU shown in drawing 8 can apply the gestalt 4 of this operation to FSU2402 shown in drawing 24 . In drawing 8 , 805A is an advice means of a slot condition during the communication link with which the control section 805 was equipped. In addition, since the configuration section shown with each signs 801-810 of drawing 8 is equivalent to the configuration section shown with each signs 101-110 of above-mentioned drawing 1 , explanation for the second time is omitted.

[0104] Next, with reference to drawing 8 and drawing 9 , especially drawing 9 , the actuation of FSU in the gestalt 4 of operation of this invention is explained. Among a maximum of 3 slots of FSU which can turn into a slot for a communication link, as an example, the 3rd slot and the 4th slot are used as a slot for a communication link, and in the slot under communication link, when the 2nd slot is in an intact condition and the communication link condition of the 3rd slot causes communication link quality degradation by interference etc., the change of the channel for a communication link can be required from FSU from a base transceiver station.

[0105] The message which requires the change is shown in drawing 9 as a communication channel change demand message. Control of advice means of slot condition 805A notifies it to a base transceiver station by inserting the "slot condition informative message" for notifying under the current slot activity of FSU, and an intact condition into a communication channel change demand message during a communication link.

[0106] By this advice of a slot condition, although a base transceiver station side transmits a communication channel change prompting message to FSU, the slot number directed within that message is made into the intact slot number which FSU notified. Since it was in the condition that the 2nd slot is intact and the information from FSU has notified to the base transceiver station that the 2nd slot is intact in this example, In order to direct that a base transceiver station also changes the channel for a communication link to the 2nd slot to FSU in response to this information, In FSU which is using two or more slots, the change of a channel can be realized during a communication link, without affecting a channel in use to a communication link by the 4th slot.

[0107] (Gestalt 5 of operation) With reference to drawing 10 and drawing 11 , FSU and base transceiver station management equipment in a gestalt 5 of operation of this invention are explained hereafter. The block diagram and drawing 11 which show the configuration [in / in drawing 10 / the gestalt 5 of operation of this invention] of FSU are the block diagram showing the configuration of the base transceiver station management equipment in the gestalt 5 of operation of this invention.

[0108] Next, with reference to drawing 10 , the configuration of FSU in the gestalt 5 of operation of this invention is explained. FSU shown in drawing 10 can apply the gestalt 5 of this operation to FSU2402 shown in drawing 24 . In drawing 10 , 1005A is the location registration system means with which the control section 1005 was equipped. In addition, since the configuration section shown with each signs 1001-1010 of drawing 10 is equivalent to the configuration section shown with each signs 101-110 of above-mentioned drawing 1 , explanation for the second time is omitted.

[0109] Moreover, in drawing 11 , the communications control section [as opposed to a base transceiver station in 1101] and 1102 are the communications control sections to a network side. 1103 is the control section of base transceiver station management equipment, and 1103A is the location registration system means established in this control section. In addition, the base transceiver station management equipment shown in drawing 11 can apply the gestalt 5 of this operation to the base transceiver station management equipment 2409 shown in drawing 24 .

[0110] Next, with reference to drawing 28 which shows drawing 10 , drawing 11 , and the basic sequence of location registration, the location registration sequence in the gestalt 5 of this operation is explained. In order to perform location registration from FSU (2402 of drawing 24) to a base transceiver station (2405 of drawing 24), when performing a location registration sequence, two or more telephone numbers of all registered into FSU are carried in the location registration demand message shown in the location registration sequence of drawing 28 by location registration system means 1005A of FSU.

[0111] When base transceiver station management equipment receives this message through a base transceiver station, base transceiver station management equipment can receive the dispatch from FSU which has recognized all the telephone numbers received by the location registration demand message to be the telephone number registered into one FSU, and was produced by control of location registration system means 1103A

after location registration, and the arrival to each telephone number registered into FSU.

[0112] (Gestalt 6 of operation) With reference to drawing 10 and drawing 11, FSU and base transceiver station management equipment in a gestalt 6 of operation of this invention are explained hereafter. That is, the gestalt 6 of this operation omits the explanation, in order to use the same drawing as drawing used with the gestalt 5 of the above-mentioned implementation.

[0113] Next, with reference to drawing 10 and drawing 11, the location registration sequence in the gestalt 6 of this operation is explained. In addition, since the basic sequence of location registration is indicated in the detail at above-mentioned drawing 28, it can refer to. In case a location registration demand message is transmitted from FSU to base transceiver station management equipment, apart from the telephone number registered into FSU, the specific number as FSU which can register two or more telephone numbers is carried in FSU, and it controls by location registration system means 1005A to transmit the specific number to two or more telephone numbers and coincidence in a base transceiver station. [two or more]

[0114] The base transceiver station management equipment side received through the base transceiver station this location registration demand message from FSU Since it can recognize that this location registration is the location registration from FSU into which two or more telephone numbers are registered by detecting the specific number of FSU and recognizing this specific number by that location registration system means 1103A It becomes easy to register two or more telephone numbers registered into the FSU also as a base transceiver station management equipment side.

[0115] (Gestalt 7 of operation) As opposed to the gestalt of the operation relevant to location registration [in / in the gestalt 7 of operation of this invention / the gestalten 5 and 6 of the above-mentioned implementation]. Therefore, a description of drawing omits. With the gestalt 7 of this operation, it is made to make the same 4 figures of each lower one of two or more telephone numbers to register, and in the WLL system by which the arrival after the location registration explained with the gestalten 5 and 6 of the above-mentioned implementation by it used PHS, since FSU can receive an arrival-of-the-mail message as the same arrival-of-the-mail group on a control channel, dc-battery saving of FSU becomes easy.

[0116] (Gestalt 8 of operation) With reference to drawing 12, the base transceiver station in the gestalt 8 of operation of this invention is explained hereafter. Drawing 12 is the block diagram showing the configuration of the base transceiver station in the gestalt 8 of operation of this invention. In addition, the base transceiver station in the gestalt 8 of this operation shown in drawing 12 is applicable to the base transceiver station 2405 shown in drawing 24.

[0117] In drawing 12, 1201 is an antenna and 1202 is a wireless circuit. The wireless circuit 1202 transmits and receives wireless data, receiving directions of a frequency and transceiver timing from the radio control section 1203. 1202A is a synthesizer which generates the frequency which was built in the wireless circuit 1202 and specified by the radio control section 1203. 1203 is the radio control section and writes in the receiving level data which measured receiving level from the wireless data of the received base transceiver station, and were measured in the memory memory in a control section 1205.

[0118] Moreover, 1204 is the channel codec section and performs the assembly of data and decomposition which have been transmitted and received by the control channel and the channel for a communication link of wireless. The control section by which 1205 controls transmission and reception of data, and 1205A are slot distribution means at the time of the connection prepared in the control section 1205. 1206 is memory information required at the time of employment, i.e., ID etc., is remembered to be, and a nonvolatile memory is used in many cases. 1207 is the interface section between network sides, such as base transceiver station management equipment. As for a network connector and 1209, 1208 is [a power circuit and 1210] power cords. In addition, the configuration section shown with each signs 1201-1210 of above-mentioned drawing 12 corresponds to the configuration section shown with each signs 2601-2610 of drawing 26 to the conventional technique.

[0119] Next, with reference to drawing 12 and drawing 2, the wireless connection-request sequence by actuation of the base transceiver station in the gestalt 8 of operation of this invention is explained. In drawing 2, a base transceiver station side judges which slot the FSU is using now by the control section 1205 or the communication link with base transceiver station management equipment, using it as the slot for control, and the slot for a communication link by recognizing ID of FSU carried in the wireless connection-request message, when a base transceiver station receives the wireless connection-request message from FSU. Based on the decision, FSU specified the current non-used slot in the channel designation message for a communication link

which transmits a base transceiver station to FSU by slot distribution means 1205A at the time of connection. Thereby, FSU enabled the communication link which used two or more slots simultaneously, without affecting the slot under communication link. In addition, a slot distribution means can act similarly in base transceiver station management equipment at the time of the above-mentioned connection.

[0120] (Gestalt 9 of operation) Next, with reference to drawing 12 , the base transceiver station in the gestalt 9 of operation of this invention is explained like the gestalt 8 of operation. However, 1205A of the base transceiver station used with the gestalt 9 of this operation shown in drawing 12 uses a slot distribution means not during a slot distribution means but during a communication link at the time of connection [as / in the gestalt 8 of operation].

[0121] Next, with reference to drawing 12 and drawing 2 , the wireless connection-request sequence by actuation of the base transceiver station in the gestalt 9 of operation of this invention is explained. When communication link quality deteriorates by asynchronous interference etc. during a communication link, a channel change message is transmitted during a communication link from FSU and a base transceiver station receives the message, it judges whether the FSU is using a base transceiver station side now by using which slot as the slot for control, and the slot for a communication link by the control section 1205 or the communication link with base transceiver station management equipment. Based on the decision, FSU specified the current non-used slot in the channel designation message for a communication link which transmits a base transceiver station to FSU by slot distribution means 1205A during a communication link. FSU enabled it to realize the change of a channel during a communication link by that cause, without affecting the slot under communication link. In addition, a slot distribution means can act similarly in base transceiver station management equipment during the above-mentioned communication link.

[0122] (Gestalt 10 of operation) With reference to drawing 13 and drawing 14 , FSU in the gestalt 10 of operation of this invention is explained hereafter. The block diagram showing the configuration [in / in drawing 13 / the gestalt 10 of operation of this invention] of FSU and drawing 14 are drawings showing the FSU dispatch sequence by the actuation of FSU shown in drawing 13 .

[0123] Next, with reference to drawing 13 , the configuration of FSU in the gestalt 10 of operation of this invention is explained. FSU shown in drawing 13 can apply the gestalt 10 of this operation to FSU2402 shown in drawing 24 . In drawing 13 , 1305A is the urgent dispatch control means with which the control section 1305 was equipped. In addition, since the configuration section shown with each signs 1301-1310 of drawing 13 is equivalent to the configuration section shown with each signs 101-110 of above-mentioned drawing 1 , explanation for the second time is omitted.

[0124] Next, with reference to drawing 13 and drawing 14 , especially drawing 14 , a FSU dispatch sequence is explained as actuation of FSU in the gestalt 10 of operation of this invention. Although it can come and the communication link of an exception cannot be performed above, when one slot is being used as three slots and a slot for control as a slot for a communication link, if the thing under communication link may be interrupted temporarily or the dispatch for urgent may be received with a certain means in FSU now, such actuation is realizable with urgent dispatch control means 1305A. For example, now, when [at which it was judged that it awaited and off-hook actuation of inner telephone was urgent dispatch] connecting By urgent dispatch control means 1305A, the communication link of one slot of the three slots already used as a slot for a communication link is interrupted or terminated. After changing a part for one slot into an intact condition as a slot for a communication link and vacating, radiocommunication connection actuation can be performed and urgent dispatch can be formed.

[0125] (Gestalt 11 of operation) With reference to drawing 15 thru/or drawing 17 , FSU in the gestalt 11 of operation of this invention is explained first. The block diagram showing the configuration [in / in drawing 15 / the gestalt 11 of operation of this invention] of FSU, drawing showing transition of the TDMA/TDD slot of FSU drawing 16 indicates actuation of the gestalt 11 of this operation to be, and drawing 17 are drawings showing the wireless connection sequence by the actuation of FSU shown in drawing 15 .

[0126] Next, with reference to drawing 15 , the configuration of FSU in the gestalt 11 of operation of this invention is explained. FSU shown in drawing 15 can apply the gestalt 11 of this operation to FSU2402 shown in drawing 24 . In drawing 15 , 1505A is the slot control means for control with which the control section 1505 was equipped. In addition, since the configuration section shown with each signs 1501-1510 of drawing 15 is equivalent to the configuration section shown with each signs 101-110 of above-mentioned drawing 1 , explanation for the second time is omitted.

[0127] Next, with reference to drawing 15 , drawing 16 , and drawing 17 , the actuation of FSU in the gestalt 11 of operation of this invention is explained. Although a wireless connection-request message is transmitted from FSU to a base transceiver station as shown in drawing 17 when the 4th dispatch or arrival occurs in a condition 3 slot in use as a slot for a communication link as shown in (A) of drawing 16 According to the procedure explained with the gestalt 1 of the above-mentioned implementation, the slot number of the slot for control specified as a channel for current control is notified to a base transceiver station that I have you specify as a slot for a communication link in that case. Then, by receiving the channel allocation message for a communication link from a base transceiver station, and changing the slot for control itself into the slot for a communication link, FSU can use all four slots as a slot for a communication link, as shown in (B) of drawing 16 .

[0128] (Gestalt 12 of operation) With reference to drawing 18 thru/or drawing 20 , FSU in the gestalt 12 of operation of this invention is explained first. The block diagram showing the configuration [in / in drawing 18 / the gestalt 12 of operation of this invention] of FSU, drawing showing transition of the TDMA/TDD slot of FSU drawing 19 indicates actuation of the gestalt 12 of this operation to be, and drawing 20 are drawings showing the wireless connection sequence by the actuation of FSU shown in drawing 18 .

[0129] Next, with reference to drawing 18 , the configuration of FSU in the gestalt 12 of operation of this invention is explained. FSU shown in drawing 18 can apply the gestalt 12 of this operation to FSU2402 shown in drawing 24. In drawing 18, 1805A is the slot control means for control with which the control section 1805 was equipped, and 1805B is the slot control means for a communication link with which the control section 1805 was equipped. In addition, since the configuration section shown with each signs 1801-1810 of drawing 18 is equivalent to the configuration section shown with each signs 101-110 of above-mentioned drawing 1, explanation for the second time is omitted.

[0130] Next, with reference to drawing 18, drawing 19, and drawing 20, the actuation of FSU in the gestalt 12 of operation of this invention is explained. Although a wireless connection-request message is transmitted from FSU to a base transceiver station as shown in drawing 20 when the 4th dispatch or arrival occurs in a condition 3 slot in use as a slot for a communication link as shown in (A) of drawing 19 In that case, the change request of the slot number is notified to a base transceiver station so that I may have the slot number of the slot for control specified as a channel for current control specified as a slot for a communication link according to the procedure explained with the gestalt 1 of the above-mentioned implementation. Then, by receiving the channel allocation message for a communication link from a base transceiver station, and changing the slot for control itself into the slot for a communication link, FSU can use all four slots as a slot for a communication link, as shown in (B) of drawing 19.

[0131] Then, when a communication link is completed also by one slot among four slots currently used as a slot for a communication link As shown in (C) of drawing 19, in order to revive the slot number 1 which was being used as a slot for control from the first as a slot for control, Except when the slot for a communication link of the slot number 1 (the 1st slot) which was being used as a slot for control from the first is completed exactly, the slot of the slot number 1 which should be used as the slot for control is once made intact.

[0132] Therefore, during the communication link explained in actuation of the gestalt 3 of the above-mentioned implementation, using the slot assignment means for a communication link, although the 1st slot usually used for the slot for control is used as a slot for a current communication link, the 1st slot for the slot for control is changed into an intact condition from the first by moving the slot to other slots. Thereby, since the 1st slot can be revived as a channel for control, the message of the control channel of the base transceiver station caught from the first can be received.

[0133] (Gestalt 13 of operation) With reference to drawing 21 thru/or drawing 23, FSU in the gestalt 13 of operation of this invention is explained first. The block diagram showing the configuration [in / in drawing 21 / the gestalt 13 of operation of this invention] of FSU, drawing showing transition of the TDMA/TDD slot of FSU drawing 22 indicates actuation of the gestalt 13 of this operation to be, and drawing 23 are drawings showing the wireless connection sequence by the actuation of FSU shown in drawing 21.

[0134] Next, with reference to drawing 21, the configuration of FSU in the gestalt 13 of operation of this invention is explained. FSU shown in drawing 21 can apply the gestalt 13 of this operation to FSU2402 shown in drawing 24. In drawing 21, 2105A is the slot control means for control with which the control section 2105 was equipped, 2105B is the slot control means for a communication link with which the control section 2105 was equipped, and 2105C is the urgent dispatch control means with which the control section 2105 was equipped. In addition, since the configuration section shown with each signs 2101-2110 of drawing 21 is

equivalent to the configuration section shown with each signs 101-110 of above-mentioned drawing 1, explanation for the second time is omitted.

[0135] Next, with reference to drawing 21, drawing 22, and drawing 23, the actuation of FSU in the gestalt 13 of operation of this invention is explained. (A) of drawing 22 shows the condition of using all four slots as a slot for a communication link. When [at which it was judged that it awaited and off-hook actuation of inner telephone was the thing of urgent dispatch] the dispatch for urgent occurs, and urgent dispatch control means 2105A connects in this condition, (Drawing 23), By the same approach as the communication link of one slot of the four slots already used as a slot for a communication link was terminated and the gestalt 12 of the above-mentioned implementation explained, as shown in (B) of drawing 22 First, after reviving the 1st slot as a slot for control, as actuation for radiocommunication connection is carried out using the 1st slot for urgent dispatch and it is further shown in (C) of drawing 22, the 1st slot can be used as the slot for a communication link, and urgent dispatch can be formed.

[0136]

[Effect of the Invention] This invention is constituted as mentioned above corresponding to the 1st object. Especially between base transceiver stations at the time of wireless connection initiation The inside of four slots of FSU, The slot number [a base transceiver station] to assign as a slot for a communication link is notified to a base transceiver station. By having been made to enable the simultaneous call of two or more telephones by one set of FSU, as it did not lap with the slot for a communication link which the telephone whose same slots of TDMA / TDD time slot seen from FSU are others uses Two or more telephones can be connected to one set of FSU, the number of FSU can be reduced, and the configuration of the wireless section and the control section which are used there can be made into the minimum.

[0137] This invention is constituted as mentioned above corresponding to the 2nd object. Especially between base transceiver stations at the time of wireless connection initiation Moreover, the inside of four slots of FSU, Each slot notifies the condition of under an activity or saying whether it is intact as a slot for a communication link to a base transceiver station, and assignment is received by using an intact slot as the slot for a communication link from a base transceiver station. By having been made to enable the simultaneous call of two or more telephones by one set of FSU, two or more telephones can be connected to one set of FSU, the number of FSU can be reduced, and the configuration of the wireless section and the control section which are used there can be made into the minimum.

[0138] Moreover, in order that this invention may be constituted as mentioned above corresponding to the 3rd object and a slot in use may change the channel for a communication link by interference from other radio stations etc. as a slot for a communication link especially, When transmitting the channel change-request message for a communication link to a base transceiver station from FSU By having enabled it to notify the slot number of the channel for a modification place communication link from the FSU side, the change of a channel can be realized during a call in FSU in which the simultaneous call of two or more telephones is possible at one set, without affecting the slot under other communication links.

[0139] Moreover, in order that this invention may be constituted as mentioned above corresponding to the 4th object and a slot in use may change the channel for a communication link by interference from other radio stations etc. as a slot for a communication link especially, When FSU transmits the channel change-request message for a communication link to a base transceiver station By each slot notifying the condition of under an activity or saying whether it is intact as a slot for a communication link to a base transceiver station, using an intact slot as a change place slot among four slots of FSU, and having made it have you direct from a base transceiver station In FSU in which the simultaneous call of two or more telephones is possible at one set, the change of a channel can be realized during a call, without affecting the slot under other communication links.

[0140] Moreover, location registration of all the telephone numbers connected to FSU can be performed at a time by constituting this invention as mentioned above corresponding to the 5th object, and having been made to perform location registration of FSU into which two or more telephone numbers are registered especially by one location registration.

[0141] Moreover, it can be made to recognize by having constituted this invention as mentioned above corresponding to the 6th object, having a specific number as FSU which can connect two or more telephones especially apart from the telephone number corresponding to two or more telephones, and having transmitted this specific number to base transceiver station management equipment that it is the location registration from FSU which can connect two or more telephones to base transceiver station management equipment.

[0142] Moreover, corresponding to the 7th object, constitute this invention as mentioned above, and it is set to FSU which can connect two or more telephones especially. Make 4 figures into the same value under two or more telephone numbers corresponding to each telephone, and timing to which FSU receives an arrival-of-the-mail message on a control channel is made the same with all the telephone numbers. By awaiting [FSU which has two or more telephone numbers, or], and having enabled it to make the period of dc-battery saving at the time into the same period as FSU which has only the one telephone number, efficient dc-battery saving can be performed also by FSU which has two or more telephone numbers.

[0143] Moreover, corresponding to the 8th object, constitute this invention as mentioned above, and FSU already sets it in the condition in use as a slot for an one or more slot communication link especially. By making it not already specify the slot of the same number as the slot for a communication link in use from FSU as a slot for a communication link to FSU at the time of wireless connection initiation A high order side can assign an intact slot to FSU which has two or more telephone numbers, without specifying a slot using from FSU or notifying the condition of a slot.

[0144] Moreover, corresponding to the 9th object, constitute this invention as mentioned above, and FSU already sets it in the condition in use as a slot for an one or more slot communication link especially. When a channel change demand message is received during a communication link from FSU, by making it not already specify the slot of the same number as the slot for a communication link in use In the change of a channel, a high order side can assign an intact slot to FSU which has two or more telephone numbers during a communication link.

[0145] Moreover, corresponding to the 10th object, constitute this invention as mentioned above, and it is especially set to FSU with two or more usable telephones. In the condition that one slot is used as three slots and a slot for control as a slot for a communication link When it awaits and there is dispatch for urgent from another inner telephone, after terminating the communication link of one slot among three slots currently used as a slot for a communication link FSU which has two or more telephone numbers by enabling it to use the slot as a communication link slot for urgent dispatch -- setting -- all the slots for a communication link -- it can respond to the dispatch for urgent also in an activity.

[0146] Moreover, corresponding to the 11th object, constitute this invention as mentioned above, and it enables it to use the time slot usually especially used as a slot for control also for the slot for a communication link as the 4th set of message channels. And when the number of activities of the slot for a communication link of telephone changes to 3 from 4 Usually, by using as an intact slot the time slot currently used as a slot for control, and having enabled it to revitalize it into the slot for control FSU of the WLL system which used the PHS method -- setting -- one TDMA/TDD frame -- the maximum coincidence -- 4 call **** -- things are made.

[0147] Moreover, corresponding to the 12th object, constitute this invention as mentioned above, and it enables it to use the time slot usually especially used as a slot for control also as a slot for a communication link of the 4th set of message channels. When the number for a communication link of telephone of slot activities changes to 3 from 4 after that In order to double with the slot number of the original slot for control the slot number which uses, carrying out a slot for control, when using it for a communication link with the slot number of the slot for control By having enabled it to revive the slot number defined as an object for control as a slot for control, after transmitting a communication link slot change-request message to a base transceiver station from FSU, in order to once make the slot intact When one call is completed, it can make it possible to receive the signal of the control channel of the original base transceiver station after coincidence 4 call.

[0148] Moreover, when this invention was constituted as mentioned above corresponding to the 13th object, it awaits when four slots are being especially used as a slot for a communication link, and the dispatch for urgent occurs from another inner telephone After terminating the communication link of one slot among four slots, the wireless connection which once sends an intact slot to urgent as a slot for control is started. And by having changed the slot into the slot for a communication link from the slot for control, dispatch for urgent can be performed also in the condition of coincidence 4 call in FSU of the WLL system which used the PHS method.

[Translation done.]

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TECHNICAL FIELD

[Field of the Invention] About the fixed telephone subscriber unit of a wireless local loop system, this invention connects two or more telephones to one set especially of FSU, and relates to the wireless local loop system which can be talked over the telephone simultaneous, and its fixed telephone subscriber unit.

[Translation done.]

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PRIOR ART

[Description of the Prior Art] In the location in which the wire telephone line network is installed by neither ordinary homes nor the entrepreneur in overseas, especially a developing country recently Instead of a wire telephone circuit and a common-name metal wire [whether a base transceiver station is installed in a dial office, and] Or install a base transceiver station near the dial office, and a dial office and a base transceiver station [whether it connects by the wire circuit, and] Or the fixed telephone subscriber unit which connects by the wireless circuit and can connect telephone to ordinary homes or a business within a station further, A common name FSU (Fixed Subscriber Unit) By installing (it is hereafter called FSU) and connecting on radio the base transceiver station and FSU which are connected by the dial office, the wireless circuit, or the wire circuit instead of a metal wire A communication mode called the wireless local loop (Wireless Local Loop) aiming at enabling it to use telephone by ordinary homes or the business within a station and a common-name WLL (henceforth WLL) system is devised.

[0003] Hereafter, the above-mentioned conventional WLL system is explained with reference to drawing 24 , drawing 25 , drawing 26 , drawing 27 , drawing 28 , drawing 29 , and drawing 30 . Drawing 24 is the conventional example of the WLL structure of a system, and is drawing showing the whole WLL structure of a system which can carry out the gestalt of each operation of this invention. Here, the example of the WLL structure of a system in ordinary homes is shown. In drawing 24 , FSU by which 2401 was installed in the house of ordinary homes and 2402 was installed in general domestic, the telephone by which 2403 is connected to FSU through a telephone cord, and 2404 are antennas of FSU generally installed out of a house.

[0004] Moreover, 2405 is FSU and a base transceiver station which performs radiocommunication, and is installed out of the dial office in the example of drawing 24 . 2406 is the antenna of a base transceiver station and 2407 is a stanchion which installs a base transceiver station 2405 and an antenna 2406. The base transceiver station 2405 is connected with the base transceiver station management equipment 2409 in a dial office 2408 through the cable cable. 2410 shows the whole high order network, common-name network network, or telephone network of a dial office.

[0005] Next, the example of a configuration of FSU is explained with reference to drawing 25 . Drawing 25 is the block diagram showing the configuration of FSU shown in drawing 24 . In drawing 25 , 2501 is an antenna connector, and since the antenna of FSU is usually installed in the outdoors, it is a connector for connecting the cable of an antenna. 2502 is a wireless circuit. The wireless circuit 2502 transmits and receives wireless data, receiving directions of a frequency and transceiver timing from the radio control section 2503. 2502A is a synthesizer which generates the signalling frequency which was built in the wireless circuit 2502 and specified by the radio control section 2503.

[0006] Moreover, the radio control section which writes in the receiving level data which 2503 measured receiving level from the wireless data of the received base transceiver station, and were measured in the memory memory in a control section 2505, 2504 is the channel codec section which performs the assembly of data and decomposition which are transmitted and received by the channel for control and the channel for a communication link of wireless. The data of the channel for a communication link consist of information, such as voice, and control information processed by the control section 2505, and signal processing is performed by the voice codec in the telephone-line interface section 2507, without user data, such as voice, minding a control section 2505.

[0007] Moreover, it is the memory which has memorized information required in order that 2506 may catch an employment base transceiver station etc., and a nonvolatile memory is used in many cases. 2507 is the telephone-line interface section which consists of a voice codec circuit, a telephone-line circuit, a terminating

signal generating circuit, a telephone off-hook detector, a telephone dial detector, etc. As for the telephone code connector which connects the telephone cord of the telephone which connects 2508 to FSU, and 2509, a power circuit and 2510 are power cords.

[0008] Next, with reference to drawing 26 , the example of a configuration of a base transceiver station is explained. Drawing 26 is the block diagram showing the configuration of the base transceiver station shown in drawing 24 . In drawing 26 , 2601 is an antenna and 2602 is a wireless circuit. The wireless circuit 2602 transmits and receives wireless data, receiving directions of a frequency and transceiver timing from the radio control section 2603. 2602A is a synthesizer which generates the frequency which was built in the wireless circuit 2602 and specified by the radio control section 2603. 2603 is the radio control section and writes in the receiving level data which measured receiving level from the wireless data of the received base transceiver station, and were measured in the memory memory in a control section 2605.

[0009] Moreover, 2604 is the channel codec section and performs the assembly of data and decomposition which have been transmitted and received by the control channel and the channel for a communication link of wireless. 2606 is memory information required at the time of employment, i.e., ID etc., is remembered to be, and a nonvolatile memory is used in many cases. 2607 is the interface section between network sides, such as base station management equipment. As for a network connector and 2609, 2608 is [a power circuit and 2610] power cords.

[0010] Next, based on drawing 24 , drawing 25 , and drawing 26 , WLL adapting the personal handy phone or PHS of a TDMA/TDD method is taken for an example, for example, the telephone of ordinary homes is used, and it explains briefly what dispatch, arrival, and a call can be performed with a WLL method.

[0011] As for the base transceiver station 2405, in the case of WLL, in drawing 24 , the case of an opposite station, i.e., the usual PHS system, has usually transmitted [be / it / under / communication link standby / setting] the information signal of a fixed period called LCCH (logic-control channel) to FSU to a mobile station (common name PS) like a general PHS public base station.

[0012] Next, with reference to drawing 26 , the actuation whose base transceiver station 2405 (drawing 24) transmits LCCH is explained. After inserting the power cord 2610 in the plug socket, switching on a power source, starting the base station management equipment interface section by the control section 2605 of a base transceiver station, and downloading required information from base transceiver station management equipment 2409 (drawing 24), and a control section 2605 controls the channel codec section 2604 and the radio control section 2603 and sets the predetermined frequency for control as synthesizer 2602A, LCCH is periodically transmitted from the wireless circuit 2602.

[0013] Next, actuation of FSU is explained with reference to drawing 25 . FSU2402 (drawing 24) receives LCCH of the base transceiver station corresponding to the base transceiver station information registered into the memory 2506 of FSU after powering on (i.e., after a power circuit 2509 supplies a power source to each part by inserting the plug of a power cord 2510 in a plug socket). The base transceiver station information registered into FSU described here is the carrier (frequency) number of LCCH which a base transceiver station transmits, the carrier number for common-name control and the entrepreneur identification code of a base transceiver station, a common-name system ID, etc.

[0014] That is, after setting up the frequency which is equivalent to the carrier number for control through the radio control section 2503 at SHINSEI sizer 2502A by control of a control section 2505 based on the information registered into the memory 2506 behind powering on and in FSU, FSU lets the channel codec section 2504 pass by control of a control section 2505, makes the wireless circuit 2502 a continuous-reception condition, and it searches LCCH of the base transceiver station which is in agreement with the system ID registered into memory 2506.

[0015] Next, the burst configuration of LCCH is explained with reference to drawing 27 . Drawing 27 is RCR which is the standard of PHS. It is the burst block diagram of LCCH which the base transceiver station currently used on the carrier for control of PHS specified by STD-28 transmits. In drawing 27 , the 42-bit base transceiver station ID is in unique WORD for PR to take a preamble and for UW take a synchronization and after that, and 9 bits of a head are equivalent to a system ID among 42 bits. Control information and CRC information continue behind a base transceiver station ID.

[0016] Next, the flow of a location registration sequence is explained with reference to drawing 28 . Drawing 28 is RCR. It is drawing showing the location registration sequence over a base transceiver station simple from FSU specified to STD-28. While FSU (2402 of drawing 24) is searching LCCH of a base transceiver station

2405 When in agreement with the system ID by which 9 bits (system ID) of heads of the base transceiver station ID in LCCH are registered into the memory 2506 of FSU The base transceiver station concerned is caught by the channel codec section 2504 by control of a control section 2505. FSU is RCR like the mobile station of the usual PHS. After exchanging the exchange of the location registration sequence specified by STD-28, i.e., the link channel establishment on a control channel, FSU and a base transceiver station shift to the channel for a communication link.

[0017] If it shifts to the channel for a communication link, in order of the layer 1 specified by OSI of ISO, a layer 2, and a layer 3, by control of a control section 2505 and the channel codec section 2504, by control of a control section 2605 and the channel codec section 2604, FSU will await a base transceiver station, after carrying out on a wireless circuit, and will go the operating sequence between FSU and a base transceiver station into a condition. By performing location registration, the positional information of FSU can be sent to a dial office side from a base transceiver station, and FSU can receive arrival of the mail now after that. The information on location registration is transmitted to base station management equipment (2409) from a base transceiver station (2405 of drawing 24).

[0018] Next, the flow of a package dispatch sequence is explained with reference to drawing 29 . Drawing 29 is RCR. It is drawing showing the dispatch sequence between the telephone based on the package dispatch sequence specified by STD-28, FSU, and a base transceiver station simple. After location registration, if the telephone (2403 of drawing 24) connected to FSU carries out off-hook, FSU will detect the off-hook signal from telephone 2403 by the control section 2505 through the telephone-line interface section 2507 of drawing 25 . If an off-hook signal is detected, by control of a control section 2505, FSU will start the dial tone sending-out circuit in the telephone-line interface section 2507, and will output a dial tone to telephone 2403.

[0019] By hearing a dial tone, a user does the depression of the dial of telephone. FSU detects the dial from telephone 2403 by the control section 2505 through the telephone-line interface section 2507. Then, about the fixed waiting timer for a dial input, a control section 2505 is RCR, when a time-out is carried out, a flare and. The sequence of the package dispatch specified by STD-28 is exchanged. That is, like the sequence of location registration, in a control channel, a link channel establishment demand message is transmitted to a base transceiver station by control of the control section 2505 of FSU, FSU is performed by a control section 2505 and the channel codec section 2504, and a base transceiver station is first performed by a control section 2605 and the channel codec section 2604 in the control in which FSU and a base transceiver station were made for FSU to shift to a message channel after receiving a link channel allocation message from the base transceiver station.

[0020] Then, FSU is the same and a base transceiver station establishes the sequence between FSU and a base transceiver station in order of a layer 1 and a layer 2 in a message channel by control of a control section 2605 and the channel codec section 2604 by the control section 2505 and the channel codec section 2504. In establishment of the sequence of a layer 3 FSU then, by the control section 2505 and the channel codec section 2504 A base transceiver station by the control section 2605 and the channel codec section 2604 When the exchange of the introduction call setup message and a call setup reception message is performed on a wireless circuit, next a base transceiver station receives a call message from base transceiver station management equipment (2409 of drawing 24) After controlling the control section 2605 of a base transceiver station to create a call message to the channel codec section 2604, it transmits a call message to FSU.

[0021] If FSU checks that the control section 2505 has received the call message from a base transceiver station through the wireless circuit 2502 and the channel codec section 2504, a control section 2505 can turn on the ADPCM codec section of the telephone-line interface section 2507, and can hear to telephone the sound (a ring back tone, common name RBT) which is calling the partner who outputs from a dial office side through a base transceiver station and FSU. By it, a user can telephone to a partner with telephone, after waiting and a partner telephone answer that a partner telephone place answers.

[0022] Next, with reference to drawing 30 , the flow of arrival and an arrival-of-the-mail response sequence is explained. Drawing 30 is RCR. It is drawing showing the arrival-of-the-mail sequence over FSU (2402 of drawing 24), and telephone simple from the base transceiver station (2405 of drawing 24) based on the arrival-of-the-mail sequence specified by STD-28. When there is arrival of the mail from a partner, a base transceiver station 2405 receives the arrival-of-the-mail information from base transceiver station management equipment 2409 first. The control section 2605 of a base transceiver station 2405 is controlled to set a signal with arrival of the mail to the channel codec section 2604.

[0023] Then, a message with a call in is transmitted to FSU (2402 of drawing 24) from the wireless circuit 2602 of a base transceiver station to the timing of LCCH, and he is RCR between a base transceiver station and FSU like the above-mentioned location registration or the sequence of dispatch henceforth. The arrival-of-the-mail sequence specified by STD-28 is exchanged. That is, FSU(s) are a control section 2505 and the channel codec section 2504, and a base transceiver station performs the exchange in a control section 2605 and the channel codec section 2604.

[0024] If FSU succeeds in an arrival-of-the-mail sequence, it will start the terminating signal generating circuit in the telephone-line interface section 2507 by control of a control section 2505, will send out a terminating signal to telephone 2403, and will carry out [sound / of telephone 2403 / ringer] singing. By this, a telephone user can know that there was arrival of the mail.

[0025] In an arrival-of-the-mail condition, when a user does off-hook [of the telephone], the control section 2505 of FSU detects the off-hook signal from telephone 3 through the telephone-line interface section 2507, lets the channel codec section 2504 and the wireless circuit 2502 pass by control of a control section 2505, and transmits a response message by wireless to a base transceiver station 2405. If a control section 2605 receives the response message from FSU through the wireless circuit 2602 and the channel codec section 2604, by control of a control section 2605, a base transceiver station 2405 will start the channel codec section 2604, and will transmit a response acknowledgement message from the wireless circuit 2602 to FSU. If the control section 2505 of FSU receives a response acknowledgement message through the wireless circuit 2502 and the channel codec section 2504, an arrival-of-the-mail response is materialized and a user can telephone to a partner with telephone 2403.

[Translation done.]

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EFFECT OF THE INVENTION

[Effect of the Invention] This invention is constituted as mentioned above corresponding to the 1st object. Especially between base transceiver stations at the time of wireless connection initiation The inside of four slots of FSU, The slot number [a base transceiver station] to assign as a slot for a communication link is notified to a base transceiver station. By having been made to enable the simultaneous call of two or more telephones by one set of FSU, as it did not lap with the slot for a communication link which the telephone whose same slots of the TDMA/TDD time slot seen from FSU are others uses Two or more telephones can be connected to one set of FSU, the number of FSU can be reduced, and the configuration of the wireless section and the control section which are used there can be made into the minimum.

[0137] This invention is constituted as mentioned above corresponding to the 2nd object. Especially between base transceiver stations at the time of wireless connection initiation Moreover, the inside of four slots of FSU, Each slot notifies the condition of under an activity or saying whether it is intact as a slot for a communication link to a base transceiver station, and assignment is received by using an intact slot as the slot for a communication link from a base transceiver station. By having been made to enable the simultaneous call of two or more telephones by one set of FSU, two or more telephones can be connected to one set of FSU, the number of FSU can be reduced, and the configuration of the wireless section and the control section which are used there can be made into the minimum.

[0138] Moreover, in order that this invention may be constituted as mentioned above corresponding to the 3rd object and a slot in use may change the channel for a communication link by interference from other radio stations etc. as a slot for a communication link especially, When transmitting the channel change-request message for a communication link to a base transceiver station from FSU By having enabled it to notify the slot number of the channel for a modification place communication link from the FSU side, the change of a channel can be realized during a call in FSU in which the simultaneous call of two or more telephones is possible at one set, without affecting the slot under other communication links.

[0139] Moreover, in order that this invention may be constituted as mentioned above corresponding to the 4th object and a slot in use may change the channel for a communication link by interference from other radio stations etc. as a slot for a communication link especially, When FSU transmits the channel change-request message for a communication link to a base transceiver station By each slot notifying the condition of under an activity or saying whether it is intact as a slot for a communication link to a base transceiver station, using an intact slot as a change place slot among four slots of FSU, and having made it have you direct from a base transceiver station In FSU in which the simultaneous call of two or more telephones is possible at one set, the change of a channel can be realized during a call, without affecting the slot under other communication links.

[0140] Moreover, location registration of all the telephone numbers connected to FSU can be performed at a time by constituting this invention as mentioned above corresponding to the 5th object, and having been made to perform location registration of FSU into which two or more telephone numbers are registered especially by one location registration.

[0141] Moreover, it can be made to recognize by having constituted this invention as mentioned above corresponding to the 6th object, having a specific number as FSU which can connect two or more telephones especially apart from the telephone number corresponding to two or more telephones, and having transmitted this specific number to base transceiver station management equipment that it is the location registration from FSU which can connect two or more telephones to base transceiver station management equipment.

[0142] Moreover, corresponding to the 7th object, constitute this invention as mentioned above, and it is set to FSU which can connect two or more telephones especially. Make 4 figures into the same value under two or

more telephone numbers corresponding to each telephone, and timing to which FSU receives an arrival-of-the-mail message on a control channel is made the same with all the telephone numbers. By awaiting [FSU which has two or more telephone numbers, or], and having enabled it to make the period of dc-battery saving at the time into the same period as FSU which has only the one telephone number, efficient dc-battery saving can be performed also by FSU which has two or more telephone numbers.

[0143] Moreover, corresponding to the 8th object, constitute this invention as mentioned above, and FSU already sets it in the condition in use as a slot for an one or more slot communication link especially. By making it not already specify the slot of the same number as the slot for a communication link in use from FSU as a slot for a communication link to FSU at the time of wireless connection initiation A high order side can assign an intact slot to FSU which has two or more telephone numbers, without specifying a slot using from FSU or notifying the condition of a slot.

[0144] Moreover, corresponding to the 9th object, constitute this invention as mentioned above, and FSU already sets it in the condition in use as a slot for an one or more slot communication link especially. When a channel change demand message is received during a communication link from FSU, by making it not already specify the slot of the same number as the slot for a communication link in use In the change of a channel, a high order side can assign an intact slot to FSU which has two or more telephone numbers during a communication link.

[0145] Moreover, corresponding to the 10th object, constitute this invention as mentioned above, and it is especially set to FSU with two or more usable telephones. In the condition that one slot is used as three slots and a slot for control as a slot for a communication link When it awaits and there is dispatch for urgent from another inner telephone, after terminating the communication link of one slot among three slots currently used as a slot for a communication link FSU which has two or more telephone numbers by enabling it to use the slot as a communication link slot for urgent dispatch -- setting -- all the slots for a communication link -- it can respond to the dispatch for urgent also in an activity.

[0146] Moreover, corresponding to the 11th object, constitute this invention as mentioned above, and it enables it to use the time slot usually especially used as a slot for control also for the slot for a communication link as the 4th set of message channels. And when the number of activities of the slot for a communication link of telephone changes to 3 from 4 Usually, by using as an intact slot the time slot currently used as a slot for control, and having enabled it to revitalize it into the slot for control FSU of the WLL system which used the PHS method -- setting -- one TDMA/TDD frame -- the maximum coincidence -- 4 call ***** -- things are made.

[0147] Moreover, corresponding to the 12th object, constitute this invention as mentioned above, and it enables it to use the time slot usually especially used as a slot for control also as a slot for a communication link of the 4th set of message channels. When the number for a communication link of telephone of slot activities changes to 3 from 4 after that In order to double with the slot number of the original slot for control the slot number which uses, carrying out a slot for control, when using it for a communication link with the slot number of the slot for control By having enabled it to revive the slot number defined as an object for control as a slot for control, after transmitting a communication link slot change-request message to a base transceiver station from FSU, in order to once make the slot intact When one call is completed, it can make it possible to receive the signal of the control channel of the original base transceiver station after coincidence 4 call.

[0148] Moreover, when this invention was constituted as mentioned above corresponding to the 13th object, it awaits when four slots are being especially used as a slot for a communication link, and the dispatch for urgent occurs from another inner telephone After terminating the communication link of one slot among four slots, the wireless connection which once sends an intact slot to urgent as a slot for control is started. And by having changed the slot into the slot for a communication link from the slot for control, dispatch for urgent can be performed also in the condition of coincidence 4 call in FSU of the WLL system which used the PHS method.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention]

[0026] However, there was one telephone connectable with FSU in the above-mentioned conventional WLL system, there were many set-type residences in the developing country by whom especially the need of a WLL system is expected, it had to install FSU in all the doors that are in demand even when installing FSU in a set-type residence, when the total cost which builds a WLL system increased, it took time in installation, and it had the problem were inefficient.

[0027] It is what was made in order that this invention might solve the above-mentioned conventional problem. Between base transceiver stations at the time of wireless connection initiation The inside of four slots of FSU, The slot number [a base transceiver station] to assign as a slot for a communication link is notified to a base transceiver station. As the same slot of TDMA / TDD time slot seen from FSU was not used in piles as a slot for a communication link of other telephones, when it was made to enable the simultaneous call of two or more telephones Two or more telephones are connected to one set of FSU, the number of FSU is reduced, and it sets it as the 1st object to offer FSU of the WLL system which can make the minimum the configuration of the wireless section and the control section which are used there.

[0028] Moreover, this invention sets it as the 2nd object to offer FSU of the WLL system which each slot can notify the condition of under an activity or saying whether it is intact as a slot for a communication link to a base transceiver station among four slots of FSU between base transceiver stations at the time of wireless connection initiation, and I can have assigned from a base transceiver station by using an intact slot as the slot for a communication link.

[0029] Moreover, this invention sets it as the 3rd object to offer FSU of the WLL system which can notify the slot number of the channel for a modification place communication link from the FSU side, when a slot in use transmits the channel change-request message for a communication link which requires modification of other channels to a base transceiver station from FSU as a slot for a communication link for the interference from other radio stations etc.

[0030] A slot in use this invention as a slot for a communication link Moreover, the interference from other radio stations etc. sake, When FSU transmits the channel change-request message for a communication link which requires modification of other channels to a base transceiver station Or the condition of saying whether it is intact is notified to a base transceiver station. the inside of four slots of FSU, and each slot -- as the slot for a communication link -- under an activity -- It sets it as the 4th object to offer FSU of the WLL system which I can have directed from a base transceiver station by using an intact slot as a change place slot.

[0031] Moreover, this invention sets it as the 5th object to offer the WLL system which can make possible location registration of all the telephone numbers connected to FSU by one location registration.

[0032] Moreover, this invention sets it as the 6th object to offer the WLL system which can tell base transceiver station management equipment about being the location registration from FSU which can connect two or more telephones by having a specific number as FSU which can connect two or more telephones apart from the telephone number corresponding to two or more telephones, and transmitting this specific number to base transceiver station management equipment.

[0033] Moreover, in FSU which can connect two or more telephones, this invention makes 4 figures the same value under two or more telephone numbers corresponding to each telephone, makes the same about all the telephone numbers timing to which FSU receives an arrival-of-the-mail message on a control channel, and sets it as the 7th object to offer FSU and its arrival-of-the-mail approach of the WLL system by which FSU can perform efficient dc-battery saving.

[0034] Moreover, this invention already sets it as the 8th object that FSU offers the base transceiver station or base transceiver station management equipment of a WLL system which can be prevented from already specifying the slot of the same number as the slot for a communication link in use as a slot for a communication link to FSU at the time of the wireless connection initiation from FSU in a condition in use as a slot for an one or more slot communication link.

[0035] Moreover, this invention sets it as the 9th object to offer the base transceiver station or base transceiver station management equipment of a WLL system which can be prevented from already specifying the slot of the same number as the slot for a communication link in use, when FSU already receives a channel change demand message during a communication link from FSU in a condition in use as a slot for an one or more slot communication link.

[0036] Moreover, this invention is set in the condition that two or more telephones are used one slot as three slots and a slot for control as a slot for a communication link in usable FSU. When it awaits and there is dispatch for urgent from another inner telephone, after terminating the communication link of one slot among three slots currently used as a slot for a communication link It sets it as the 10th object to offer FSU of the WLL system which can use the slot as a communication link slot for urgent dispatch.

[0037] Moreover, this invention makes the time slot usually used as a slot for control the 4th set of message channels. When it enables it to use it also as a slot for a communication link and the number of activities of the slot for a communication link of telephone changes to 3 from 4 Usually, the time slot currently used as a slot for control is used as an intact slot, and it sets it as the 11th object to offer FSU of a WLL system which can revitalize it into the slot for control.

[0038] Moreover, when this invention enables it to use the time slot usually used as a slot for control as a slot for a communication link as the 4th set of message channels and the number for a communication link of telephone of slot activities changes to 3 from 4, In order to double with the slot number of the original slot for control the slot number which uses, carrying out a slot for control When the slot corresponding to the slot number of the slot for control is used by the slot for a communication link It sets it as the 12th object to offer FSU of a WLL system which can revive the slot of the decided number as a slot for control after transmitting a communication link slot change-request message to a base transceiver station from FSU, in order to once make the slot intact.

[0039] Moreover, when four slots of this inventions are awaited when using it as a slot for a communication link, and the dispatch for urgent occurs from another inner telephone, after terminating the communication link of 1 in 4 slots slot By once performing wireless connection initiation of dispatch for urgent for an intact slot as a slot for control, and changing the slot concerned as a slot for a communication link from the slot for control It sets it as the 13th object to offer FSU of the WLL system which can confirm dispatch for urgent.

[Translation done.]

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MEANS

[Means for Solving the Problem] In case this invention transmits a wireless connection-request message to a base transceiver station from the control means which connects two or more telephones, and FSU into FSU in order to attain the 1st object, it establishes the slot assignment means for a communication link into the message at the time of the connection which directs from FSU the slot used as a channel for a communication link.

[0041] As opposed to the 1st object of this invention between base transceiver stations at the time of wireless connection initiation The inside of four slots of FSU, The slot number [a base transceiver station] to assign as a slot for a communication link is notified to a base transceiver station. By having been made to enable the simultaneous call of two or more telephones by one set of FSU, as it did not lap with the slot for a communication link which the telephone whose same slots of TDMA / TDD time slot seen from FSU are others uses Two or more telephones are connected to one set of FSU, the number of FSU is reduced, and FSU of the WLL system which can make the minimum the configuration of the wireless section and the control section which are used there is obtained.

[0042] This invention establishes the advice means of a slot condition in FSU at the time of the connection for notifying the current busy condition of the time slot of a fixed telephone subscriber unit to a base transceiver station in order to attain the 2nd object.

[0043] As opposed to the 2nd object of this invention between base transceiver stations at the time of wireless connection initiation The inside of four slots of FSU, Each slot notifies the condition of under an activity or saying whether it is intact as a slot for a communication link to a base transceiver station, and assignment is received by using an intact slot as the slot for a communication link from a base transceiver station. By having been made to enable the simultaneous call of two or more telephones by one set of FSU, two or more telephones are connected to one set of FSU, the number of FSU is reduced, and FSU of the WLL system which can make the minimum the configuration of the wireless section and the control section which are used there is obtained.

[0044] When carrying out message sending of the slot change request for a communication link from FSU to a base transceiver station during a communication link, this invention establishes the slot assignment means for a communication link in FSU during the communication link which specifies the slot used as a channel for a communication link from FSU, in order to attain the 3rd object.

[0045] In order that a slot in use may change the channel for a communication link by interference from other radio stations etc. as a slot for a communication link to the 3rd object of this invention, When transmitting the channel change-request message for a communication link to a base transceiver station from FSU By having enabled it to notify the slot number of the channel for a modification place communication link from the FSU side In FSU in which the simultaneous call of two or more telephones is possible at one set, FSU of a WLL system which can realize the change of a channel during a call, without affecting the slot under other communication links is obtained.

[0046] When carrying out message sending of the slot change request for a communication link from FSU to a base transceiver station during a communication link, this invention establishes the advice means of a slot condition in FSU during the communication link which notifies the busy condition of a current time slot from FSU, in order to attain the 4th object.

[0047] In order that, as for this invention, a slot in use may change the channel for a communication link by interference from other radio stations etc. as a slot for a communication link to the 4th object, When FSU transmits the channel change-request message for a communication link to a base transceiver station By each slot notifying the condition of under an activity or saying whether it is intact as a slot for a communication link

to a base transceiver station, using an intact slot as a change place slot among four slots of FSU, and having made it have you direct from a base transceiver station In FSU in which the simultaneous call of two or more telephones is possible at one set, FSU of a WLL system which can realize the change of a channel during a call, without affecting the slot under other communication links is obtained.

[0048] This invention establishes the location registration system means whose location registration to the base transceiver station management equipment of two or more telephone numbers registered into FSU becomes possible by one location registration in order to attain the 5th object.

[0049] When this invention was made to perform location registration of FSU into which two or more telephone numbers are registered by one location registration to the 5th object, the wireless local loop system which can perform location registration of all the telephone numbers connected to FSU at a time is obtained.

[0050] This invention by also registering the specific number as FSU into FSU into which two or more telephone numbers are registered, going up the specific number, carrying in a message, and performing location registration in order to attain the 6th object After making it know that it is the location registration from FSU by which two or more telephone numbers are registered into the base transceiver station management equipment side, the location registration system means which makes possible location registration of two or more telephone numbers of all is established.

[0051] The wireless local loop system which can make it recognize that it is the location registration from FSU which can connect two or more telephones to base transceiver station management equipment when this invention has a specific number as FSU which can connect two or more telephones to the 6th object especially apart from the telephone number corresponding to two or more telephones and transmitted this specific number to base transceiver station management equipment is obtained.

[0052] Since this invention attains the 7th object, it makes 4 figures the same value under two or more telephone numbers registered into FSU, and can be made to perform arrival to all the telephone numbers registered in the control channel which receives the terminating signal of the same arrival-of-the-mail group of the slot for control.

[0053] In FSU to which this invention can connect two or more telephones to the 7th object Make 4 figures into the same value under two or more telephone numbers corresponding to each telephone, and timing to which FSU receives an arrival-of-the-mail message on a control channel is made the same with all the telephone numbers. By awaiting also by FSU which has two or more telephone numbers, and having enabled it to make the period of dc-battery saving at the time into the same period as FSU which has only the one telephone number FSU and its arrival-of-the-mail approach of the WLL system which can perform efficient dc-battery saving also by FSU which has two or more telephone numbers are acquired.

[0054] After it receives the wireless connection request from FSU, this invention establishes a slot distribution means in a base transceiver station or base transceiver station management equipment at the time of the connection it is made not to specify a slot in use and the slot of the same number as a slot for a communication link by FSU actually, in order to attain the 8th object.

[0055] FSU already sets this invention in the condition in use as a slot for an one or more slot communication link to the 8th object. By making it not already specify the slot of the same number as the slot for a communication link in use as a slot for a communication link to FSU at the time of the wireless connection initiation from FSU Without specifying a slot using from FSU or notifying the condition of a slot The base transceiver station or base transceiver station management equipment of a wireless local loop system which a high order side can assign an intact slot to FSU which has two or more telephone numbers is obtained.

[0056] After it receives the channel change request for a communication link of the slot under communication link from FSU, this invention establishes a slot distribution means in a base transceiver station or base transceiver station management equipment during the communication link controlled not to specify a slot in use and the slot of the same number as a slot for a communication link by FSU, in order to attain the 9th object.

[0057] FSU already sets this invention in the condition in use as a slot for an one or more slot communication link to the 9th object. When a channel change demand message is received during a communication link from FSU, by making it not already specify the slot of the same number as the slot for a communication link in use The base transceiver station or base transceiver station management equipment of a wireless local loop system which can assign an intact slot in the change of a channel to FSU which has two or more telephone numbers during a communication link is obtained.

[0058] In order to attain the 10th object, in FSU, this invention uses three slots as the slot for a communication

link, and when the dispatch for urgent awaits and it generates from inner telephone while in use, it establishes the urgent dispatch control means which uses one slot of the three slots for the dispatch for urgent by using one slot as the slot for control.

[0059] This invention is set to FSU with two or more usable telephones to the 10th object. In the condition that one slot is used as three slots and a slot for control as a slot for a communication link When it awaits and there is dispatch for urgent from another inner telephone, after terminating the communication link of one slot among three slots currently used as a slot for a communication link FSU which has two or more telephone numbers by having enabled it to use the slot as a communication link slot for urgent dispatch -- setting -- all the slots for a communication link -- FSU of the WLL system which can respond to the dispatch for urgent also in an activity is obtained.

[0060] This invention establishes the slot control means for control for using a maximum of four slots of slots for a communication link within FSU in order to attain the 11th object.

[0061] This invention enables it to use the time slot usually used as a slot for control also for the slot for a communication link as the 4th set of message channels to the 11th object. And when the number of activities of the slot for a communication link of telephone changes to 3 from 4 usually, the thing for which use as an intact slot the time slot currently used as a slot for control, and it enabled it to revitalize it into the slot for control -- the one TDMA / the TDD frame -- the maximum coincidence -- 4 call **** -- FSU of the WLL system which can do things is obtained.

[0062] This invention establishes the slot control means for a communication link which used the slot of the defined slot number as a slot for control, when the slot for a communication link turns into three or less slots after enabling it to use a maximum of four slots of slots for a communication link in FSU in order to attain the 12th object.

[0063] This invention enables it to use the time slot usually used as a slot for control also as a slot for a communication link of the 4th set of message channels to the 12th object. When the number for a communication link of telephone of slot activities changes to 3 from 4 after that In order to double with the slot number of the original slot for control the slot number which uses, carrying out a slot for control, when using it for a communication link with the slot number of the slot for control By having enabled it to revive the slot number defined as an object for control as a slot for control, after transmitting a communication link slot change-request message to a base transceiver station from FSU, in order to once make the slot intact After coincidence 4 call, when one call is completed, FSU of a WLL system which can make it possible to receive the signal of the control channel of the original base transceiver station is obtained.

[0064] After enabling it to use a maximum of four slots of slots for a communication link within FSU, when the dispatch for urgent awaits and it generates from inner telephone, this invention establishes the urgent dispatch control means which uses one slot of the four slots for the dispatch for urgent, in order to attain the 13th object.

[0065] When four slots of this inventions are awaited to the 13th object when using it as a slot for a communication link, and the dispatch for urgent occurs from another inner telephone After terminating the communication link of one slot among four slots, the wireless connection which once sends the intact slot to urgent as a slot for control is started. By having changed the slot into the slot for a communication link from the slot for control, FSU of a WLL system which can perform dispatch for urgent is obtained also in the condition of coincidence 4 call.

[0066]

[Embodiment of the Invention] The fixed telephone subscriber unit in invention of this invention according to claim 1 It connects by base transceiver station management equipment, and the base transceiver station and wireless by which it connected with the cable and 1 or two or more telephones were connected to the telephone network. The control means which is the fixed telephone subscriber unit of the wireless local loop system which communicates with TDMA / TDD method, and controls connection of two or more telephones, When starting a communication link to said base transceiver station from the telephone connected with said cable It has a slot assignment means for a communication link at the time of the connection which specifies the slot for a communication link used from a fixed telephone subscriber unit as a channel for a communication link to a base transceiver station. By making it the slot which two or more telephones use not lap, and having been made to enable the simultaneous call of two or more telephones by one set of FSU, using TDMA / TDD slot efficiently The number of FSU is reduced and it has an operation that the configuration of the wireless section and the control section which are used there can be made into the minimum.

[0067] The fixed telephone subscriber unit in invention of this invention according to claim 2 It connects by base transceiver station management equipment, and the base transceiver station and wireless by which it connected with the cable and 1 or two or more telephones were connected to the telephone network. The control means which is the fixed telephone subscriber unit of the wireless local loop system which communicates with TDMA / TDD method, and controls connection of two or more telephones, When starting a communication link to said base transceiver station from the telephone connected with said cable It has an advice means of a slot condition at the time of the connection which notifies the current busy condition of the TDMA/TDD slot in said fixed telephone subscriber unit. According to advice of the busy condition of said slot, receive assignment by using an intact slot as the slot for a communication link from a base transceiver station, and a TDMA/TDD slot is used efficiently. By having been made to enable the simultaneous call of two or more telephones by one set of FSU, the number of FSU is reduced and it has an operation that the configuration of the wireless section and the control section which are used there can be made into the minimum.

[0068] The fixed telephone subscriber unit in invention of this invention according to claim 3 When said control means judged, that communication link quality deteriorated during the communication link between said fixed telephone subscriber units and base transceiver stations When transmitting the channel change-request message for a communication link from said fixed telephone subscriber unit to a base transceiver station Have a slot assignment means for a communication link during the communication link which specifies the slot for a communication link which a fixed telephone subscriber unit uses as a channel for a communication link, and the simultaneous call of two or more telephones sets to possible FSU by one set. It has an operation that the change of a message channel is realizable, without after the change of a message channel affecting the slot under other communication links by asynchronous interference etc.

[0069] The fixed telephone subscriber unit in invention of this invention according to claim 4 When said control means judged, that communication link quality deteriorated during the communication link between said fixed telephone subscriber units and base transceiver stations When transmitting the channel change-request message for a communication link from said fixed telephone subscriber unit to a base transceiver station It has an advice means of a slot condition during the communication link which notifies the current busy condition of the TDMA/TDD slot in a fixed telephone subscriber unit. It has an operation that the change of a message channel is realizable, without after a message channel change affecting other message channels by asynchronous interference etc.

[0070] The wireless local loop system in invention of this invention according to claim 5 It has a fixed telephone subscriber unit according to claim 1 or 2 and base transceiver station management equipment connected to the telephone network. Said fixed telephone subscriber unit holds the telephone number of two or more telephones connected. It has the location registration system means which carries out location registration of said two or more telephone numbers of all by 1 time of the location registration demand message to base transceiver station management equipment. Said base transceiver station management equipment is equipped with a location registration system means to recognize all the telephone numbers received from said fixed telephone subscriber unit to be the telephone number registered into one fixed telephone subscriber unit, and to process. It has an operation that the location registration to the base transceiver station management equipment of two or more telephone numbers registered into FSU can be substituted for one location registration by FSU.

[0071] The wireless local loop system in invention of this invention according to claim 6 It has a fixed telephone subscriber unit according to claim 1 or 2 and base transceiver station management equipment connected to the telephone network. Said fixed telephone subscriber unit holds the telephone number of two or more telephones connected. Apart from the telephone number of each of said telephone, it has a specific number as a fixed telephone subscriber unit. It has the location registration system means which carries and carries out location registration of said specific number to a location registration demand message. It has a location registration system means to recognize it as said base transceiver station management equipment being the location registration to two or more telephone numbers of all registered into said fixed telephone subscriber unit by the specific number received from said fixed telephone subscriber unit. While being able to substitute for one location registration by FSU the location registration to the base transceiver station management equipment of two or more telephone numbers registered into FSU It has the operation of the ability to make it recognize that it is the location registration from FSU which can connect two or more telephones to base transceiver station management equipment.

[0072] The fixed telephone subscriber unit in invention of this invention according to claim 7 By making 4

figures into the same value under two or more telephone numbers corresponding to 1 or two or more telephones which are connected with said cable, and performing location registration The arrival-of-the-mail message to all the telephones connected to the fixed telephone subscriber unit It is made to receive by the channel which is equivalent to the same arrival group in the message for control which a base transceiver station transmits, and even if it is FSU which has two or more telephone numbers, it has an operation that the same dc-battery saving as FSU which has the single telephone number can be performed.

[0073] The arrival-of-the-mail approach of the fixed telephone subscriber unit in invention of this invention according to claim 8 Make 4 figures into the same value under the telephone number of two or more telephones connected to one fixed telephone subscriber unit, and location registration is performed to a base transceiver station. It is made to consist of each process which receives the arrival-of-the-mail message to all the telephones connected to the fixed telephone subscriber unit by the channel which is equivalent to the same arrival group in the message for control which transmits from a base transceiver station. Even if it is FSU which has two or more telephone numbers, it has an operation that the same dc-battery saving as FSU which has the single telephone number can be performed.

[0074] The base transceiver station in invention of this invention according to claim 9 It is the base transceiver station of the wireless local loop system connected with the fixed telephone subscriber unit to which it connects with a telephone network and 1 or two or more telephones are connected with the cable on radio by the TDMA/TDD method. When dispatch or arrival new when said fixed telephone subscriber unit has already used it as a slot for the one or more slot communication link in 4 slots arises based on the information on said fixed telephone subscriber unit, It has a slot distribution means at the time of the connection controlled not to specify the slot of the same number as a slot for a communication link. By assigning an intact slot from a high order side to FSU which has two or more telephone numbers, without specifying a slot using from FSU or notifying the condition of a slot It has an operation that two or more simultaneous call in FSU is realizable, using a TDMA/TDD slot efficiently.

[0075] The base transceiver station management equipment in invention of this invention according to claim 10 It is base transceiver station management equipment connected through the base transceiver station connected with the fixed telephone subscriber unit to which it connects with a telephone network and 1 or two or more telephones are connected with the cable on radio by the TDMA/TDD method. When dispatch or arrival new when said fixed telephone subscriber unit has already used it as a slot for the one or more slot communication link in 4 slots arises based on the information on said fixed telephone subscriber unit, It has a slot distribution means at the time of the connection controlled not to specify the slot of the same number as a slot for a communication link. By assigning an intact slot from a high order side to FSU which has two or more telephone numbers, without specifying a slot using from FSU or notifying the condition of a slot It has an operation that two or more simultaneous call in FSU is realizable, using a TDMA/TDD slot efficiently.

[0076] The base transceiver station in invention of this invention according to claim 11 It is the base transceiver station of the wireless local loop system connected with the fixed telephone subscriber unit to which it connects with a telephone network and 1 or two or more telephones are connected with the cable on radio by the TDMA/TDD method. When the fixed telephone subscriber unit has already used it based on the information on said fixed telephone subscriber unit as a slot for the two or more slot communication link in 4 slots When the control means of said fixed telephone subscriber unit judged with communication link quality having deteriorated When said base transceiver station receives the channel change-request message for a communication link from said fixed telephone subscriber unit Have a slot distribution means during the communication link controlled to specify the intact slot number which other telephones have not already used as a channel for modification, and it sets to the change of a channel during a communication link. Are not from the FSU side and by assignment from a high order side by assigning an intact slot to FSU which has two or more telephone numbers It has an operation that a message channel change is realizable, without after a message channel change affecting other message channels by asynchronous interference etc.

[0077] The base transceiver station management equipment in invention of this invention according to claim 12 It is base transceiver station management equipment connected through the base transceiver station connected with the fixed telephone subscriber unit to which it connects with a telephone network and 1 or two or more telephones are connected with the cable on radio by the TDMA/TDD method. When the fixed telephone subscriber unit has already used it based on the information on said fixed telephone subscriber unit as a slot for the two or more slot communication link in 4 slots When the control means of said fixed telephone subscriber

unit judged with communication link quality having deteriorated When said base transceiver station management equipment receives the channel change-request message for a communication link from said fixed telephone subscriber unit Have a slot distribution means during the communication link controlled to specify the intact slot number which other telephones have not already used as a channel for modification, and it sets to the change of a channel during a communication link. Are not from the FSU side and by assignment from a high order side by assigning an intact slot to FSU which has two or more telephone numbers It has an operation that a message channel change is realizable, without after a message channel change affecting other message channels by asynchronous interference etc.

[0078] The fixed telephone subscriber unit in invention of this invention according to claim 13 It connects on radio with the base transceiver station and TDMA/TDD method which were connected to the telephone network. It is the fixed telephone subscriber unit of the wireless local loop system to which 1 or two or more telephones are connected with the cable. While establishing the control means which connects two or more telephones and using one slot as three slots and a slot for control as a slot for a communication link in the case of said one fixed telephone subscriber unit When the dispatch for urgent occurs from said another telephone connected, as a slot for a communication link The inside of three slots in use, FSU which is made to end the communication link of one slot, is equipped with the urgent dispatch control means which assigns the slot as a slot for urgent dispatch, and has two or more telephone numbers -- setting -- all the slots for a communication link -- it has an operation that urgent dispatch is realizable also in an activity.

[0079] The fixed telephone subscriber unit in invention of this invention according to claim 14 When using all four slots as a slot for a communication link, stop the slot for control and a maximum of four telephones enable the call to the same time amount. It has the slot control means for control controlled to revive said stopped slot for control when the slot for a communication link turns into three or less slots. In the WLL system of the TDMA/TDD method which has a maximum of 4 slots, realizing the simultaneous call for several maximum slot minutes has the operation of *****.

[0080] The fixed telephone subscriber unit in invention of this invention according to claim 15 When a slot in use turns into three slots from four slots as a slot for a communication link Usually, when the slot currently assigned as a slot for control is using it as a communication link slot, It has the slot control means for a communication link which notifies the change request of a communication link slot in use to a base transceiver station. Usually, it is made to revitalize the slot currently assigned as a slot for control as a slot for control, and has an operation that the simultaneous call for several maximum slot minutes is realizable, in the WLL system of the TDMA/TDD method which has a maximum of 4 slots.

[0081] The fixed telephone subscriber unit in invention of this invention according to claim 16 The control means which controls two or more telephones connected with the cable is established in one case. It is the fixed telephone subscriber unit of the wireless local loop which enabled it to communicate a maximum of four slots as a slot for a communication link with a TDMA/TDD method to a base transceiver station. When the dispatch for urgent occurs as a slot for a communication link from another telephone connected with said cable during 4 slot activity When the communication link of one slot is terminated among four slots in use and it is under activity by using as a communication link slot the slot of the number which usually assigns as a slot for control and is, The slot control means for a communication link which notifies the change request of a communication link slot in use to a base transceiver station, After performing the connection request for urgent to a base transceiver station using the slot for control furthermore made intact by modification of said slot, It has the urgent dispatch control means which changes the slot for control into the slot for a communication link, and is used for urgent dispatch. In the WLL system of the TDMA/TDD method which is made to enable urgent dispatch and has a maximum of 4 slots also in an activity as a slot for an a maximum of 4 slot communication link While the simultaneous call for several maximum slot minutes is realizable, it has an operation that the urgent dispatch from another telephone is realizable at the time of two or more simultaneous call.

[0082] Hereafter, the gestalt of operation of this invention is explained to a detail based on an accompanying drawing, drawing 1 , or drawing 24 .

(Gestalt 1 of operation) With reference to drawing 1 thru/or drawing 3 , FSU in the gestalt 1 of operation of this invention is explained first. The block diagram showing the configuration [in / in drawing 1 / the gestalt 1 of operation of this invention] of FSU, drawing showing the wireless connection sequence by actuation of FSU which shows drawing 2 to drawing 1 , and drawing 3 are drawings showing the configuration of the TDMA/TDD frame used with the gestalt 1 of this operation.

[0083] Next, with reference to drawing 1 , the configuration of FSU in the gestalt 1 of operation of this invention is explained. In addition, drawing showing the whole WLL structure of a system shown in drawing 24 is referred to in explanation of the gestalt 1 of this operation, and the gestalt of all the following operations. FSU shown in drawing 1 can apply the gestalt 1 of this operation to FSU2402 shown in drawing 24 .

[0084] In drawing 1 , 101 is an antenna connector, and since the antenna of FSU is usually installed in the outdoors, it is a connector for connecting the cable of an antenna. 102 is a wireless circuit. The wireless circuit 102 transmits and receives wireless data, receiving directions of a frequency and transceiver timing from the radio control section 103. 102A is a synthesizer which generates the signalling frequency which was built in the wireless circuit 102 and specified by the radio control section 103.

[0085] The radio control section which writes in the receiving level data which 103 measured receiving level from the wireless data of the received base transceiver station, and were measured in the memory memory in a control section 105 and 104 [moreover,] It is the channel codec section which performs the assembly of data and decomposition which are transmitted and received by the channel for control and the channel for a communication link of wireless. The data of the channel for a communication link consist of information, such as voice, and control information processed by the control section 105, and signal processing is performed by the voice codec in the telephone-line interface section 107, without user data, such as voice, minding a control section 105. Moreover, 105A is a slot assignment means for a communication link at the time of the connection with which the control section 105 was equipped.

[0086] Moreover, it is the memory which has memorized information required in order that 106 may catch an employment base transceiver station etc., and a nonvolatile memory is used in many cases. 107 is the telephone-line interface section which consists of a voice codec circuit, a telephone-line circuit, a terminating signal generating circuit, a telephone off-hook detector, a telephone dial detector, etc. As for the telephone code connector which connects the telephone cord of the telephone which connects 108 to FSU, and 109, a power circuit and 110 are power cords. In addition, the configuration section shown with each signs 101-110 of above-mentioned drawing 1 corresponds to the configuration section shown with each signs 2501-2510 of drawing 25 to the conventional technique.

[0087] Next, with reference to drawing 2 , the wireless connection sequence which is actuation of FSU in the gestalt 1 of operation of this invention is explained. A wireless connection sequence is roughly divided and is divided into three, a dispatch sequence, an arrival-of-the-mail sequence, and a location registration sequence. Hereafter, with reference to drawing 1 and drawing 2 , a dispatch sequence is explained to an example for actuation of the gestalt 1 of this operation. First, the telephone code connector 108 and the telephone-line interface section 107 are minded. If the control section 105 of FSU detects the off-hook condition of the telephone connected to FSU, while a control section 105 will start the sound-source generating circuit in the telephone-line interface section 107 and outputting a dial tone to telephone. The channel codec section 104 and the radio control section 103 are controlled, the wireless circuit 102 and synthesizer 102A are operated, and the wireless connection sequence for sending to a base transceiver station is started.

[0088] In this wireless connection sequence, slot assignment means 105A for a communication link notifies the slot which has a wireless connection-request message specified from the FSU side as delivery and a slot for a communication link to a base transceiver station at the time of the connection which it had in the control section 105.

[0089] Hereafter, with reference to drawing 3 , it explains why I need to have you specify as a slot for a communication link. Drawing 3 is drawing showing the TDMA/TDD frame currently used by the Personal Handyphone System (PHS) currently used in for example, Japan, Thailand, etc.

[0090] In the example shown in drawing 3 , it is drawing of a TDMA/TDD frame seen from the FSU side which can register two or more telephones, and suppose that it is in the condition that the 3rd slot and the 4th slot are used as a communication link slot. And the 1st slot shall be used as only for [for control] slots. The wireless connection-request message containing the slot assignment informative message which specifies [as opposed to / as drawing 2 shows so that a base transceiver station may assign the 2nd slot by slot assignment means 105for communication link A at the time of connection, since the slot which FSU can use as a slot for a communication link when there is another telephone newly connected to FSU in this condition to dispatch is only the 2nd slot / a base transceiver station] a slot on wireless transmits, and it notifies. The 2nd slot is assigned from a base transceiver station as a slot for a communication link to FSU by this informative message, and the communication link with three sets simultaneous as FSU can be formed in this example.

[0091] (Gestalt 2 of operation) With reference to drawing 4 and drawing 5 , FSU in the gestalt 2 of operation of this invention is explained hereafter. The block diagram showing the configuration [in / in drawing 4 / the gestalt 2 of operation of this invention] of FSU and drawing 5 are drawings showing the wireless connection sequence (dispatch sequence) by the actuation of FSU shown in drawing 4 .

[0092] First, with reference to drawing 4 , the configuration of FSU in the gestalt 2 of operation of this invention is explained. FSU shown in drawing 4 can apply the gestalt 2 of this operation to FSU2402 shown in drawing 24 . In drawing 4 , 405A is an advice means of a slot condition at the time of the connection with which the control section 405 was equipped. In addition, since the configuration section shown with each signs 401-410 of drawing 4 is equivalent to the configuration section shown with each signs 101-110 of above-mentioned drawing 1 , explanation for the second time is omitted.

[0093] Next, with reference to drawing 4 and drawing 5 , especially drawing 5 , the actuation of FSU in the gestalt 2 of operation of this invention is explained. If the control section 405 of FSU detects the off-hook condition of the telephone connected to FSU through the telephone code connector 408 and the telephone-line interface section 407, a control section 405 will control the channel codec section 404 and the radio control section 403, will operate the wireless circuit 402 and synthesizer 402A, and will start wireless connection while it starts the sound-source generating circuit in the telephone-line interface section 407 and outputs a dial tone to telephone.

[0094] In this wireless connection sequence, advice means of slot condition 405A notifies the current busy condition of four slots seen from FSU from the FSU side to a base transceiver station at the time of the connection with which the control section 405 was equipped. This message shall be included in a wireless connection-request message as a "slot condition informative message."

[0095] Moreover, the 1st slot carries out to it being used as only for [for control] slots, and the 3rd slot and the 4th slot being already under activity as a slot for a communication link like the gestalt 1 of the above-mentioned implementation. In this condition, when there is newly dispatch from another telephone connected to FSU, the wireless connection-request message containing the slot condition informative message which notifies that slot busy condition is transmitted from FSU to a base transceiver station. That is, in the 1st slot, the 3rd slot and the 4th slot notify during an activity that the 2nd slot is among intact during an activity as slots for a communication link as a control slot to a base transceiver station by advice means of slot condition 405A at the time of connection.

[0096] A base transceiver station assigns the 2nd intact slot from a base transceiver station as a slot for a communication link to FSU with reference to this informative message. Therefore, in this example, that communication link can be formed in three telephones coincidence by one set of FSU.

[0097] under an activity, the 2nd slot, and the 3rd slot are [the 1st slot / under an activity and the 4th slot] moreover, intact [from FSU] as another example, when the 2nd slot and the 3rd slot are intact as slots for a communication link as a slot for control -- thing advice is given. Although this slot condition informative message is the same as that of what is contained in the wireless connection-request message shown in drawing 2 of the dispatch sequence in the gestalt 1 of the above-mentioned implementation, the slot assignment informative message shown in drawing 2 will replace a slot condition informative message in drawing 5 . In the case of this example, from a base transceiver station, either the 2nd intact slot or the 3rd slot is specified by FSU. In this example, the activity of coincidence 2 slot is further attained as FSU.

[0098] (Gestalt 3 of operation) With reference to drawing 6 and drawing 7 , FSU in the gestalt 3 of operation of this invention is explained hereafter. The block diagram showing the configuration [in / in drawing 6 / the gestalt 3 of operation of this invention] of FSU and drawing 7 are drawings showing the communication channel change demand sequence by the actuation of FSU shown in drawing 6 .

[0099] Next, with reference to drawing 6 , the configuration of FSU in the gestalt 3 of operation of this invention is explained. FSU shown in drawing 6 can apply the gestalt 3 of this operation to FSU2402 shown in drawing 24 . In drawing 6 , 605A is a slot assignment means for a communication link during the communication link with which the control section 605 was equipped. In addition, since the configuration section shown with each signs 601-610 of drawing 6 is equivalent to the configuration section shown with each signs 101-110 of above-mentioned drawing 1 , explanation for the second time is omitted.

[0100] Next, with reference to drawing 6 and drawing 7 , especially drawing 7 , the actuation of FSU in the gestalt 3 of operation of this invention is explained. Among a maximum of 3 slots of FSU which can turn into a slot for a communication link, as an example, the 3rd slot and the 4th slot are used as a slot for a

communication link, and in the slot under communication link, when the 2nd slot is in an intact condition and the communication link condition of the 3rd slot causes communication link quality degradation by interference etc., the change of the channel for a communication link can be required from FSU from a base transceiver station. The message which requires the change is shown in drawing 7 as a communication channel change demand message. Control of slot assignment means 605A for a communication link notifies it to a base transceiver station by inserting the slot number specifying as FSU in the communication channel change demand message as a "slot assignment informative message" during a communication link.

[0101] By this advice of slot assignment, although a base transceiver station side transmits a communication channel change prompting message to FSU, the slot number directed within that message is made into the slot number specified by FSU. In this example, the change of a channel can be realized during a communication link in FSU which is using two or more slots, without affecting a channel in use to a communication link by the 4th slot, in order to direct that a base transceiver station also changes the channel for a communication link to the 2nd slot to FSU by specifying the 2nd slot from FSU, since it was in the condition that the 2nd slot is intact.

[0102] (Gestalt 4 of operation) With reference to drawing 8 and drawing 9, FSU in the gestalt 4 of operation of this invention is explained hereafter. The block diagram showing the configuration [in / in drawing 8 / the gestalt 4 of operation of this invention] of FSU and drawing 9 are drawings showing the communication channel change demand sequence by the actuation of FSU shown in drawing 8.

[0103] Next, with reference to drawing 8, the configuration of FSU in the gestalt 4 of operation of this invention is explained. FSU shown in drawing 8 can apply the gestalt 4 of this operation to FSU2402 shown in drawing 24. In drawing 8, 805A is an advice means of a slot condition during the communication link with which the control section 805 was equipped. In addition, since the configuration section shown with each signs 801-810 of drawing 8 is equivalent to the configuration section shown with each signs 101-110 of above-mentioned drawing 1, explanation for the second time is omitted.

[0104] Next, with reference to drawing 8 and drawing 9, especially drawing 9, the actuation of FSU in the gestalt 4 of operation of this invention is explained. Among a maximum of 3 slots of FSU which can turn into a slot for a communication link, as an example, the 3rd slot and the 4th slot are used as a slot for a communication link, and in the slot under communication link, when the 2nd slot is in an intact condition and the communication link condition of the 3rd slot causes communication link quality degradation by interference etc., the change of the channel for a communication link can be required from FSU from a base transceiver station.

[0105] The message which requires the change is shown in drawing 9 as a communication channel change demand message. Control of advice means of slot condition 805A notifies it to a base transceiver station by inserting the "slot condition informative message" for notifying under the current slot activity of FSU, and an intact condition into a communication channel change demand message during a communication link.

[0106] By this advice of a slot condition, although a base transceiver station side transmits a communication channel change prompting message to FSU, the slot number directed within that message is made into the intact slot number which FSU notified. Since it was in the condition that the 2nd slot is intact and the information from FSU has notified to the base transceiver station that the 2nd slot is intact in this example, In order to direct that a base transceiver station also changes the channel for a communication link to the 2nd slot to FSU in response to this information, In FSU which is using two or more slots, the change of a channel can be realized during a communication link, without affecting a channel in use to a communication link by the 4th slot.

[0107] (Gestalt 5 of operation) With reference to drawing 10 and drawing 11, FSU and base transceiver station management equipment in a gestalt 5 of operation of this invention are explained hereafter. The block diagram and drawing 11 which show the configuration [in / in drawing 10 / the gestalt 5 of operation of this invention] of FSU are the block diagram showing the configuration of the base transceiver station management equipment in the gestalt 5 of operation of this invention.

[0108] Next, with reference to drawing 10, the configuration of FSU in the gestalt 5 of operation of this invention is explained. FSU shown in drawing 10 can apply the gestalt 5 of this operation to FSU2402 shown in drawing 24. In drawing 10, 1005A is the location registration system means with which the control section 1005 was equipped. In addition, since the configuration section shown with each signs 1001-1010 of drawing 10 is equivalent to the configuration section shown with each signs 101-110 of above-mentioned drawing 1, explanation for the second time is omitted.

[0109] Moreover, in drawing 11, the communications control section [as opposed to a base transceiver station

in 1101] and 1102 are the communications control sections to a network side. 1103 is the control section of base transceiver station management equipment, and 1103A is the location registration system means established in this control section. In addition, the base transceiver station management equipment shown in drawing 11 can apply the gestalt 5 of this operation to the base transceiver station management equipment 2409 shown in drawing 24 .

[0110] Next, with reference to drawing 28 which shows drawing 10 , drawing 11 , and the basic sequence of location registration, the location registration sequence in the gestalt 5 of this operation is explained. In order to perform location registration from FSU (2402 of drawing 24) to a base transceiver station (2405 of drawing 24), when performing a location registration sequence, two or more telephone numbers of all registered into FSU are carried in the location registration demand message shown in the location registration sequence of drawing 28 by location registration system means 1005A of FSU.

[0111] When base transceiver station management equipment receives this message through a base transceiver station, base transceiver station management equipment can receive the dispatch from FSU which has recognized all the telephone numbers received by the location registration demand message to be the telephone number registered into one FSU, and was produced by control of location registration system means 1103A after location registration, and the arrival to each telephone number registered into FSU.

[0112] (Gestalt 6 of operation) With reference to drawing 10 and drawing 11 , FSU and base transceiver station management equipment in a gestalt 6 of operation of this invention are explained hereafter. That is, the gestalt 6 of this operation omits the explanation, in order to use the same drawing as drawing used with the gestalt 5 of the above-mentioned implementation.

[0113] Next, with reference to drawing 10 and drawing 11 , the location registration sequence in the gestalt 6 of this operation is explained. In addition, since the basic sequence of location registration is indicated in the detail at above-mentioned drawing 28 , it can refer to. In case a location registration demand message is transmitted from FSU to base transceiver station management equipment, apart from the telephone number registered into FSU, the specific number as FSU which can register two or more telephone numbers is carried in FSU, and it controls by location registration system means 1005A to transmit the specific number to two or more telephone numbers and coincidence in a base transceiver station. [two or more]

[0114] The base transceiver station management equipment side received through the base transceiver station this location registration demand message from FSU Since it can recognize that this location registration is the location registration from FSU into which two or more telephone numbers are registered by detecting the specific number of FSU and recognizing this specific number by that location registration system means 1103A It becomes easy to register two or more telephone numbers registered into the FSU also as a base transceiver station management equipment side.

[0115] (Gestalt 7 of operation) As opposed to the gestalt of the operation relevant to location registration [in / in the gestalt 7 of operation of this invention / the gestalten 5 and 6 of the above-mentioned implementation]. Therefore, a description of drawing omits. With the gestalt 7 of this operation, it is made to make the same 4 figures of each lower one of two or more telephone numbers to register, and in the WLL system by which the arrival after the location registration explained with the gestalten 5 and 6 of the above-mentioned implementation by it used PHS, since FSU can receive an arrival-of-the-mail message as the same arrival-of-the-mail group on a control channel, dc-battery saving of FSU becomes easy.

[0116] (Gestalt 8 of operation) With reference to drawing 12 , the base transceiver station in the gestalt 8 of operation of this invention is explained hereafter. Drawing 12 is the block diagram showing the configuration of the base transceiver station in the gestalt 8 of operation of this invention. In addition, the base transceiver station in the gestalt 8 of this operation shown in drawing 12 is applicable to the base transceiver station 2405 shown in drawing 24 .

[0117] In drawing 12 , 1201 is an antenna and 1202 is a wireless circuit. The wireless circuit 1202 transmits and receives wireless data, receiving directions of a frequency and transceiver timing from the radio control section 1203. 1202A is a synthesizer which generates the frequency which was built in the wireless circuit 1202 and specified by the radio control section 1203. 1203 is the radio control section and writes in the receiving level data which measured receiving level from the wireless data of the received base transceiver station, and were measured in the memory memory in a control section 1205.

[0118] Moreover, 1204 is the channel codec section and performs the assembly of data and decomposition which have been transmitted and received by the control channel and the channel for a communication link of

wireless. The control section by which 1205 controls transmission and reception of data, and 1205A are slot distribution means at the time of the connection prepared in the control section 1205. 1206 is memory information required at the time of employment, i.e., ID etc., is remembered to be, and a nonvolatile memory is used in many cases. 1207 is the interface section between network sides, such as base transceiver station management equipment. As for a network connector and 1209, 1208 is [a power circuit and 1210] power cords. In addition, the configuration section shown with each signs 1201-1210 of above-mentioned drawing 12 corresponds to the configuration section shown with each signs 2601-2610 of drawing 26 to the conventional technique.

[0119] Next, with reference to drawing 12 and drawing 2 , the wireless connection-request sequence by actuation of the base transceiver station in the gestalt 8 of operation of this invention is explained. In drawing 2 , a base transceiver station side judges which slot the FSU is using now by the control section 1205 or the communication link with base transceiver station management equipment, using it as the slot for control, and the slot for a communication link by recognizing ID of FSU carried in the wireless connection-request message, when a base transceiver station receives the wireless connection-request message from FSU. Based on the decision, FSU specified the current non-used slot in the channel designation message for a communication link which transmits a base transceiver station to FSU by slot distribution means 1205A at the time of connection. Thereby, FSU enabled the communication link which used two or more slots simultaneously, without affecting the slot under communication link. In addition, a slot distribution means can act similarly in base transceiver station management equipment at the time of the above-mentioned connection.

[0120] (Gestalt 9 of operation) Next, with reference to drawing 12 , the base transceiver station in the gestalt 9 of operation of this invention is explained like the gestalt 8 of operation. However, 1205A of the base transceiver station used with the gestalt 9 of this operation shown in drawing 12 uses a slot distribution means not during a slot distribution means but during a communication link at the time of connection [as / in the gestalt 8 of operation].

[0121] Next, with reference to drawing 12 and drawing 2 , the wireless connection-request sequence by actuation of the base transceiver station in the gestalt 9 of operation of this invention is explained. When communication link quality deteriorates by asynchronous interference etc. during a communication link, a channel change message is transmitted during a communication link from FSU and a base transceiver station receives the message, it judges whether the FSU is using a base transceiver station side now by using which slot as the slot for control, and the slot for a communication link by the control section 1205 or the communication link with base transceiver station management equipment. Based on the decision, FSU specified the current non-used slot in the channel designation message for a communication link which transmits a base transceiver station to FSU by slot distribution means 1205A during a communication link. FSU enabled it to realize the change of a channel during a communication link by that cause, without affecting the slot under communication link. In addition, a slot distribution means can act similarly in base transceiver station management equipment during the above-mentioned communication link.

[0122] (Gestalt 10 of operation) With reference to drawing 13 and drawing 14 , FSU in the gestalt 10 of operation of this invention is explained hereafter. The block diagram showing the configuration [in / in drawing 13 / the gestalt 10 of operation of this invention] of FSU and drawing 14 are drawings showing the FSU dispatch sequence by the actuation of FSU shown in drawing 13 .

[0123] Next, with reference to drawing 13 , the configuration of FSU in the gestalt 10 of operation of this invention is explained. FSU shown in drawing 13 can apply the gestalt 10 of this operation to FSU2402 shown in drawing 24 . In drawing 13 , 1305A is the urgent dispatch control means with which the control section 1305 was equipped. In addition, since the configuration section shown with each signs 1301-1310 of drawing 13 is equivalent to the configuration section shown with each signs 101-110 of above-mentioned drawing 1 , explanation for the second time is omitted.

[0124] Next, with reference to drawing 13 and drawing 14 , especially drawing 14 , a FSU dispatch sequence is explained as actuation of FSU in the gestalt 10 of operation of this invention. Although it can come and the communication link of an exception cannot be performed above, when one slot is being used as three slots and a slot for control as a slot for a communication link, if the thing under communication link may be interrupted temporarily or the dispatch for urgent may be received with a certain means in FSU now, such actuation is realizable with urgent dispatch control means 1305A. For example, now, when [at which it was judged that it awaited and off-hook actuation of inner telephone was urgent dispatch] connecting By urgent dispatch control

means 1305A, the communication link of one slot of the three slots already used as a slot for a communication link is interrupted or terminated. After changing a part for one slot into an intact condition as a slot for a communication link and vacating, radiocommunication connection actuation can be performed and urgent dispatch can be formed.

[0125] (Gestalt 11 of operation) With reference to drawing 15 thru/or drawing 17 , FSU in the gestalt 11 of operation of this invention is explained first. The block diagram showing the configuration [in / in drawing 15 / the gestalt 11 of operation of this invention] of FSU, drawing showing transition of the TDMA/TDD slot of FSU drawing 16 indicates actuation of the gestalt 11 of this operation to be, and drawing 17 are drawings showing the wireless connection sequence by the actuation of FSU shown in drawing 15 .

[0126] Next, with reference to drawing 15 , the configuration of FSU in the gestalt 11 of operation of this invention is explained. FSU shown in drawing 15 can apply the gestalt 11 of this operation to FSU2402 shown in drawing 24 . In drawing 15 , 1505A is the slot control means for control with which the control section 1505 was equipped. In addition, since the configuration section shown with each signs 1501-1510 of drawing 15 is equivalent to the configuration section shown with each signs 101-110 of above-mentioned drawing 1 , explanation for the second time is omitted.

[0127] Next, with reference to drawing 15 , drawing 16 , and drawing 17 , the actuation of FSU in the gestalt 11 of operation of this invention is explained. Although a wireless connection-request message is transmitted from FSU to a base transceiver station as shown in drawing 17 when the 4th dispatch or arrival occurs in a condition 3 slot in use as a slot for a communication link as shown in (A) of drawing 16 According to the procedure explained with the gestalt 1 of the above-mentioned implementation, the slot number of the slot for control specified as a channel for current control is notified to a base transceiver station that I have you specify as a slot for a communication link in that case. Then, by receiving the channel allocation message for a communication link from a base transceiver station, and changing the slot for control itself into the slot for a communication link, FSU can use all four slots as a slot for a communication link, as shown in (B) of drawing 16 .

[0128] (Gestalt 12 of operation) With reference to drawing 18 thru/or drawing 20 , FSU in the gestalt 12 of operation of this invention is explained first. The block diagram showing the configuration [in / in drawing 18 / the gestalt 12 of operation of this invention] of FSU, drawing showing transition of the TDMA/TDD slot of FSU drawing 19 indicates actuation of the gestalt 12 of this operation to be, and drawing 20 are drawings showing the wireless connection sequence by the actuation of FSU shown in drawing 18 .

[0129] Next, with reference to drawing 18 , the configuration of FSU in the gestalt 12 of operation of this invention is explained. FSU shown in drawing 18 can apply the gestalt 12 of this operation to FSU2402 shown in drawing 24 . In drawing 18 , 1805A is the slot control means for control with which the control section 1805 was equipped, and 1805B is the slot control means for a communication link with which the control section 1805 was equipped. In addition, since the configuration section shown with each signs 1801-1810 of drawing 18 is equivalent to the configuration section shown with each signs 101-110 of above-mentioned drawing 1 , explanation for the second time is omitted.

[0130] Next, with reference to drawing 18 , drawing 19 , and drawing 20 , the actuation of FSU in the gestalt 12 of operation of this invention is explained. Although a wireless connection-request message is transmitted from FSU to a base transceiver station as shown in drawing 20 when the 4th dispatch or arrival occurs in a condition 3 slot in use as a slot for a communication link as shown in (A) of drawing 19 In that case, the change request of the slot number is notified to a base transceiver station so that I may have the slot number of the slot for control specified as a channel for current control specified as a slot for a communication link according to the procedure explained with the gestalt 1 of the above-mentioned implementation. Then, by receiving the channel allocation message for a communication link from a base transceiver station, and changing the slot for control itself into the slot for a communication link, FSU can use all four slots as a slot for a communication link, as shown in (B) of drawing 19 .

[0131] Then, when a communication link is completed also by one slot among four slots currently used as a slot for a communication link As shown in (C) of drawing 19 , in order to revive the slot number 1 which was being used as a slot for control from the first as a slot for control, Except when the slot for a communication link of the slot number 1 (the 1st slot) which was being used as a slot for control from the first is completed exactly, the slot of the slot number 1 which should be used as the slot for control is once made intact.

[0132] Therefore, during the communication link explained in actuation of the gestalt 3 of the above-mentioned implementation, using the slot assignment means for a communication link, although the 1st slot usually used

for the slot for control is used as a slot for a current communication link, the 1st slot for the slot for control is changed into an intact condition from the first by moving the slot to other slots. Thereby, since the 1st slot can be revived as a channel for control, the message of the control channel of the base transceiver station caught from the first can be received.

[0133] (Gestalt 13 of operation) With reference to drawing 21 thru/or drawing 23 , FSU in the gestalt 13 of operation of this invention is explained first. The block diagram showing the configuration [in / in drawing 21 / the gestalt 13 of operation of this invention] of FSU, drawing showing transition of the TDMA/TDD slot of FSU drawing 22 indicates actuation of the gestalt 13 of this operation to be, and drawing 23 are drawings showing the wireless connection sequence by the actuation of FSU shown in drawing 21 .

[0134] Next, with reference to drawing 21 , the configuration of FSU in the gestalt 13 of operation of this invention is explained. FSU shown in drawing 21 can apply the gestalt 13 of this operation to FSU2402 shown in drawing 24 . In drawing 21 , 2105A is the slot control means for control with which the control section 2105 was equipped, 2105B is the slot control means for a communication link with which the control section 2105 was equipped, and 2105C is the urgent dispatch control means with which the control section 2105 was equipped. In addition, since the configuration section shown with each signs 2101-2110 of drawing 21 is equivalent to the configuration section shown with each signs 101-110 of above-mentioned drawing 1 , explanation for the second time is omitted.

[0135] Next, with reference to drawing 21 , drawing 22 , and drawing 23 , the actuation of FSU in the gestalt 13 of operation of this invention is explained. (A) of drawing 22 shows the condition of using all four slots as a slot for a communication link. When [at which it was judged that it awaited and off-hook actuation of inner telephone was the thing of urgent dispatch] the dispatch for urgent occurs, and urgent dispatch control means 2105A connects in this condition, (Drawing 23), By the same approach as the communication link of one slot of the four slots already used as a slot for a communication link was terminated and the gestalt 12 of the above-mentioned implementation explained, as shown in (B) of drawing 22 First, after reviving the 1st slot as a slot for control, as actuation for radiocommunication connection is carried out using the 1st slot for urgent dispatch and it is further shown in (C) of drawing 22 , the 1st slot can be used as the slot for a communication link, and urgent dispatch can be formed.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The block diagram showing the configuration of FSU in the gestalt 1 of operation of this invention,

[Drawing 2] Drawing showing the wireless connection sequence by the actuation of FSU shown in drawing 1 ,

[Drawing 3] Drawing showing the configuration of the TDMA/TDD frame used with the gestalt 1 of this operation,

[Drawing 4] The block diagram showing the configuration of FSU in the gestalt 2 of operation of this invention,

[Drawing 5] Drawing showing the wireless connection sequence (dispatch sequence) by the actuation of FSU shown in drawing 4 ,

[Drawing 6] The block diagram showing the configuration of FSU in the gestalt 3 of operation of this invention,

[Drawing 7] Drawing showing the communication channel change demand sequence by the actuation of FSU shown in drawing 6 ,

[Drawing 8] The block diagram showing the configuration of FSU in the gestalt 4 of operation of this invention,

[Drawing 9] Drawing showing the communication channel change demand sequence by the actuation of FSU shown in drawing 8 ,

[Drawing 10] The block diagram showing the configuration of FSU in the gestalt 5 of operation of this invention,

[Drawing 11] The block diagram showing the configuration of the base transceiver station management equipment in the gestalt 5 of operation of this invention,

[Drawing 12] The block diagram showing the configuration of the base transceiver station in the gestalt 8 of operation of this invention,

[Drawing 13] The block diagram showing the configuration of FSU in the gestalt 10 of operation of this invention,

[Drawing 14] Drawing showing the FSU dispatch sequence by the actuation of FSU shown in drawing 13 ,

[Drawing 15] The block diagram showing the configuration of FSU in the gestalt 11 of operation of this invention,

[Drawing 16] Drawing showing transition of the TDMA/TDD slot of FSU which shows actuation of the gestalt 11 of this operation,

[Drawing 17] Drawing showing the wireless connection sequence by the actuation of FSU shown in drawing 15 ,

[Drawing 18] The block diagram showing the configuration of FSU in the gestalt 12 of operation of this invention,

[Drawing 19] Drawing showing transition of the TDMA/TDD slot of FSU which shows actuation of the gestalt 12 of this operation,

[Drawing 20] Drawing showing the wireless connection sequence by the actuation of FSU shown in drawing 18 ,

[Drawing 21] The block diagram showing the configuration of FSU in the gestalt 13 of operation of this invention,

[Drawing 22] Drawing showing transition of the TDMA/TDD slot of FSU which shows actuation of the gestalt

13 of this operation,

[Drawing 23] Drawing showing the wireless connection sequence by the actuation of FSU shown in drawing 21 ,

[Drawing 24] Drawing showing the whole WLL structure of a system which is the conventional example of the WLL structure of a system, and can carry out the gestalt of each operation of this invention,

[Drawing 25] The block diagram showing the configuration of FSU shown in drawing 24 ,

[Drawing 26] The block diagram showing the configuration of the base transceiver station shown in drawing 24 ,

[Drawing 27] RCR which is the standard of PHS Burst block diagram of LCCH which the base transceiver station currently used on the carrier for control of PHS specified by STD-28 transmits,

[Drawing 28] RCR Drawing showing the location registration sequence over a base transceiver station simple from FSU specified to STD-28,

[Drawing 29] RCR Drawing showing the dispatch sequence between the telephone based on the package dispatch sequence specified by STD-28, FSU, and a base transceiver station simple,

[Drawing 30] RCR Drawing showing the arrival-of-the-mail sequence over FSU and telephone simple from the base transceiver station based on the arrival-of-the-mail sequence specified by STD-28.

[Description of Notations]

101 401 Antenna connector

102 402 Wireless circuit

102A, 402A Synthesizer

103 403 Radio control section

104 404 Channel codec section

105 405 Control section

105A It is a slot assignment means for a communication link at the time of connection.

405A It is an advice means of a slot condition at the time of connection.

106 406 Memory

107 407 Telephone-line interface section

108 408 Telephone code connector

109 409 Power circuit

110 410 Power cord

601 801 Antenna connector

602 802 Wireless circuit

602A, 802A Synthesizer

603 803 Radio control section

604 804 Channel codec section

605 805 Control section

605A It is a slot assignment means for a communication link during a communication link.

805A It is an advice means of a slot condition during a communication link.

606 806 Memory

607 807 Telephone-line interface section

608 808 Telephone code connector

609 809 Power circuit

610 810 Power cord

1001 2501 Antenna connector

1002 2502 Wireless circuit

1002A, 2502A Synthesizer

1003 2503 Radio control section

1004 2504 Channel codec section

1005 2505 Control section

1005A Location registration system means

1006 2506 Memory

1007 2507 Telephone-line interface section

1008 2508 Telephone code connector

1009 2509 Power circuit
1010 2510 Power cord
1101 Communications Control Section
1102 Communications Control Section
1103 Control Section
1103A Location registration system means
1201 2601 Antenna
1202 2602 Wireless circuit
1202A, 2602A Synthesizer
1203 2603 Radio control section
1204 2604 Channel codec section
1205 2605 Control section
1205A It is a slot distribution means at the time of connection.
1206 2606 Memory
1207 2607 Interface section
1208 2608 Network connector
1209 2609 Power circuit
1210 2610 Power cord
2401 House
2402 FSU
2403 Telephone
2404 Antenna
2405 Base Transceiver Station
2406 Antenna
2407 Stanchion
2408 Dial Office
2409 Base Transceiver Station Management Equipment
2410 Network Network

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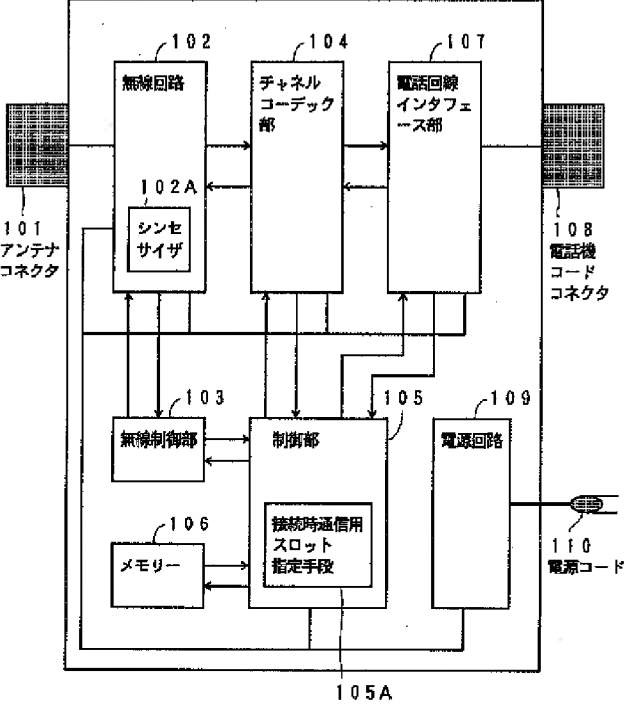
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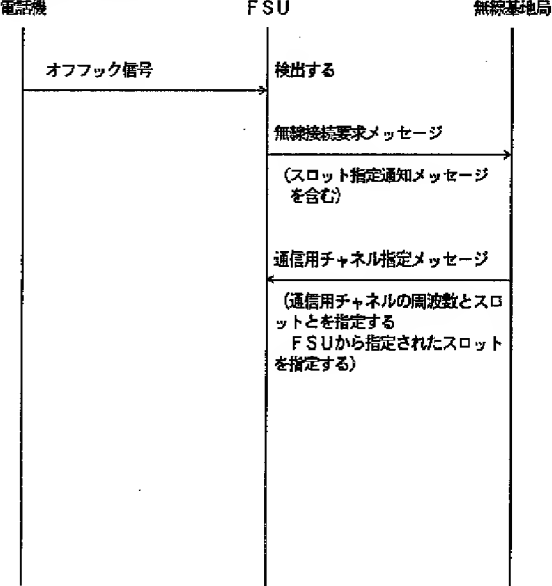
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DRAWINGS

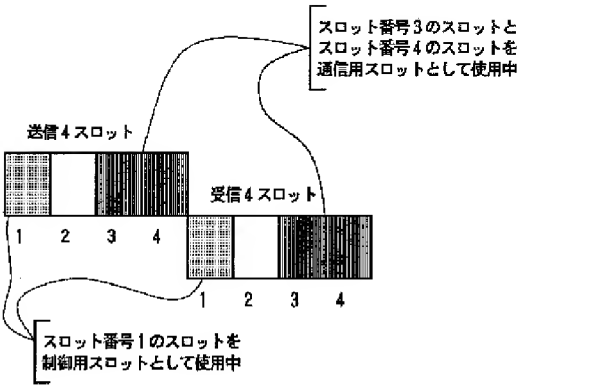
[Drawing 1]



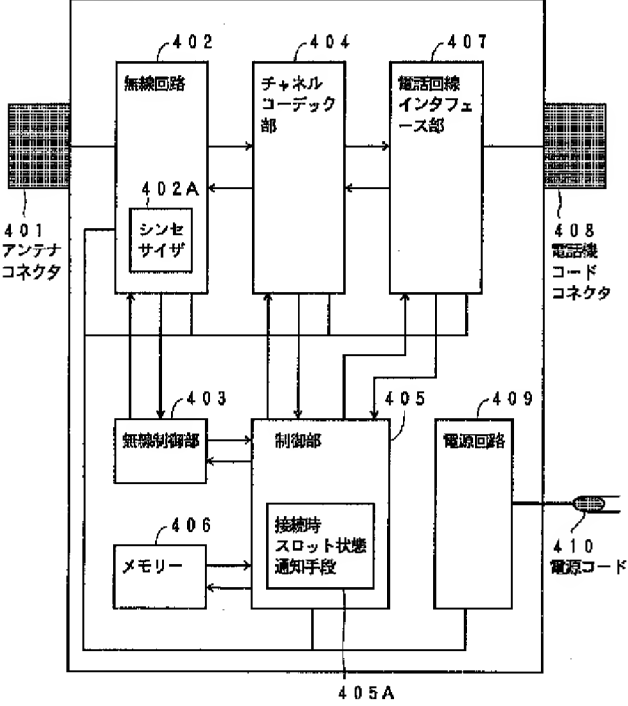
[Drawing 2]



[Drawing 3]



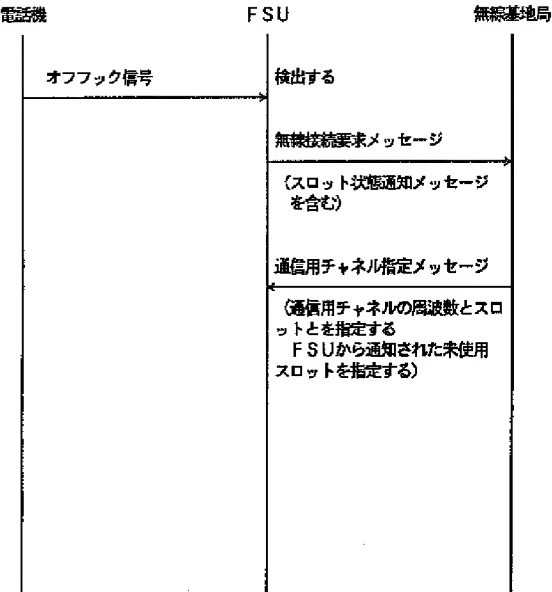
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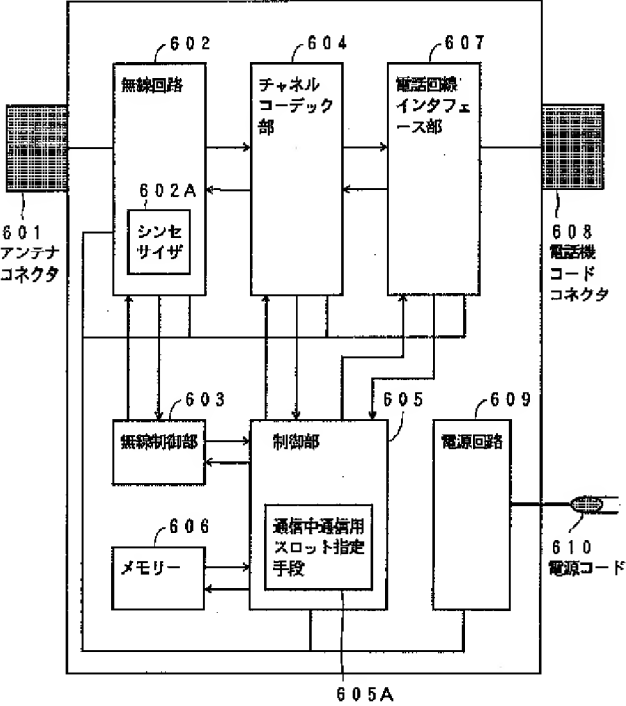
[Drawing 27]

PR	UW	基地局ID	制御情報	CRC
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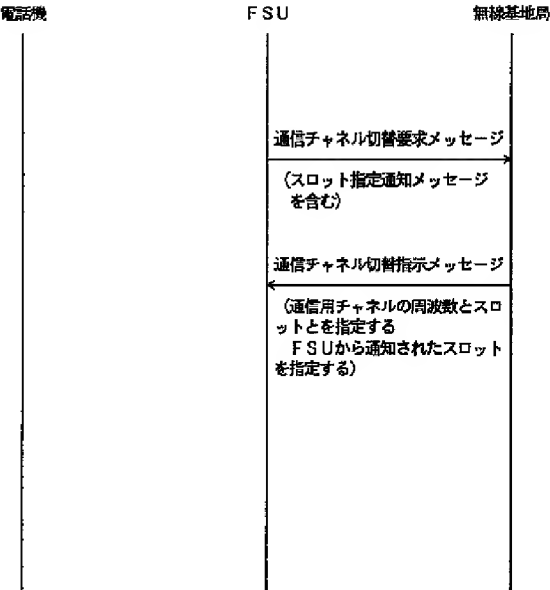
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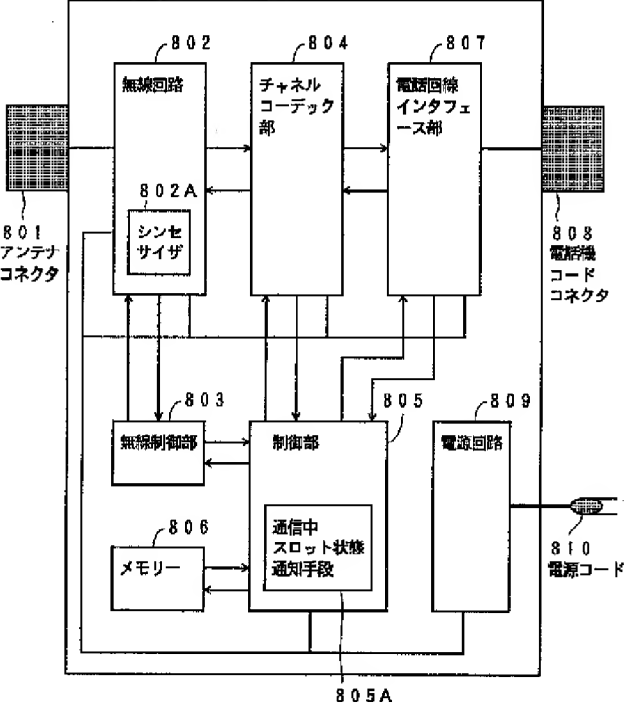
[Drawing 6]



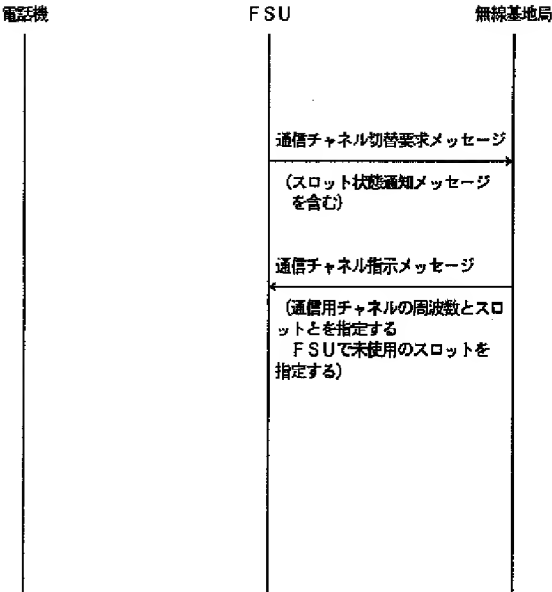
[Drawing 7]



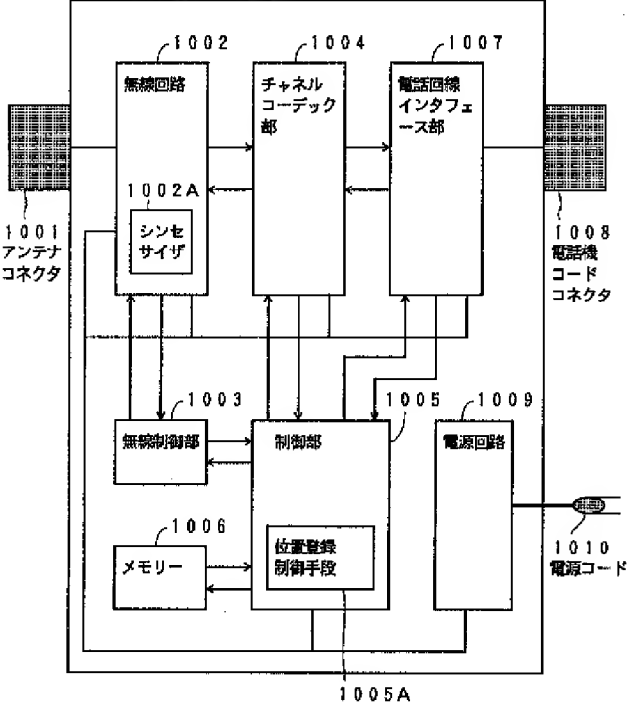
[Drawing 8]



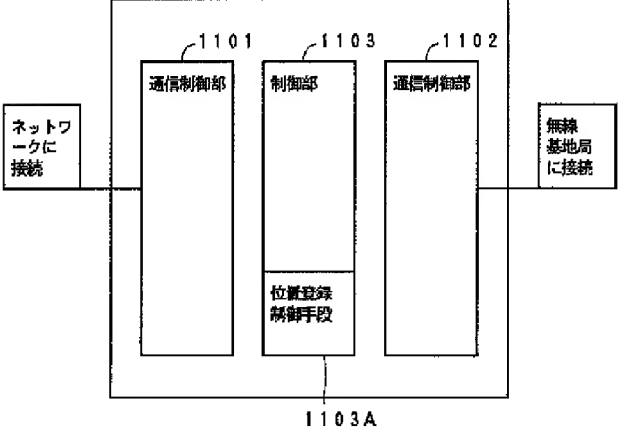
[Drawing 9]



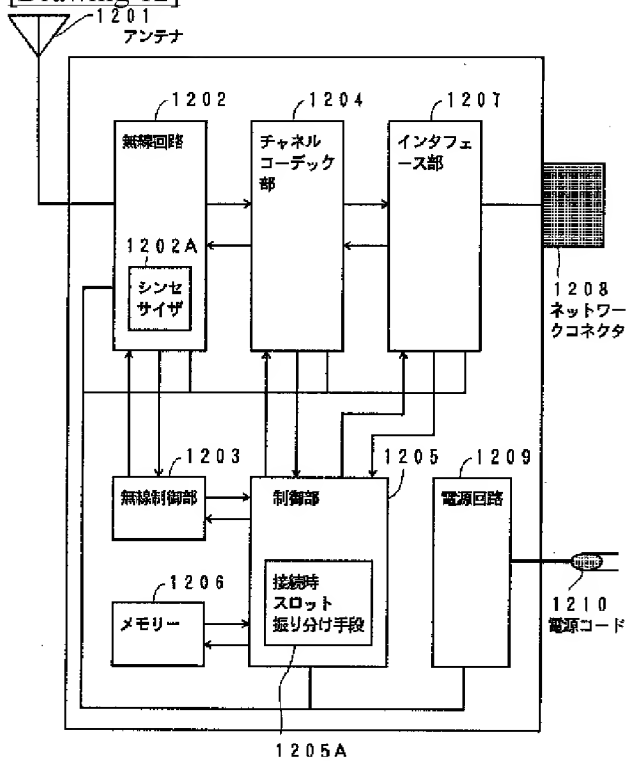
[Drawing 10]



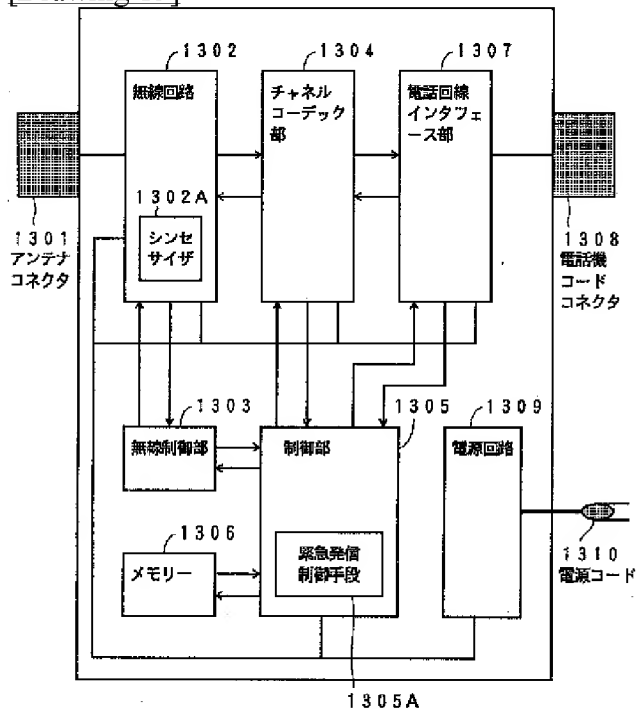
[Drawing 11]



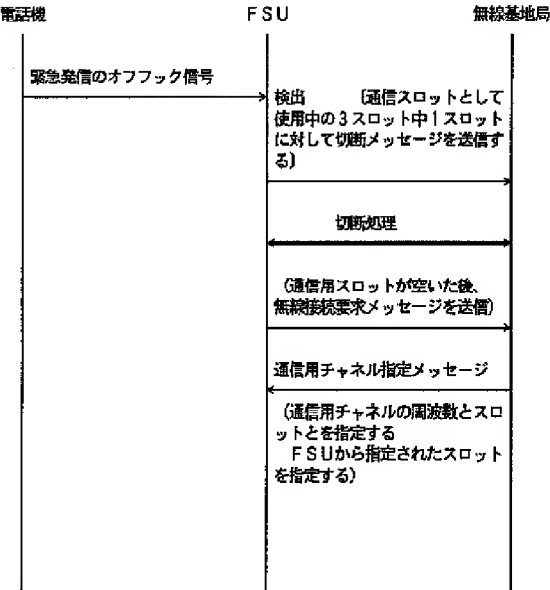
[Drawing 12]



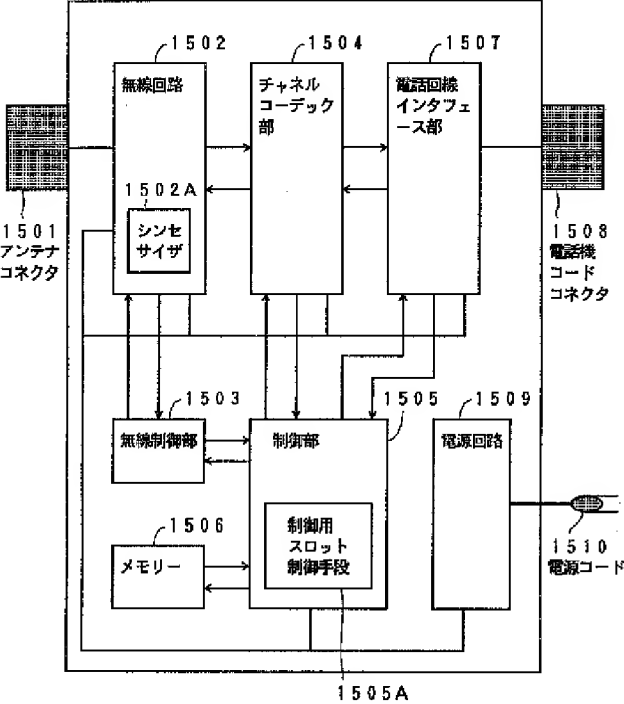
[Drawing 13]



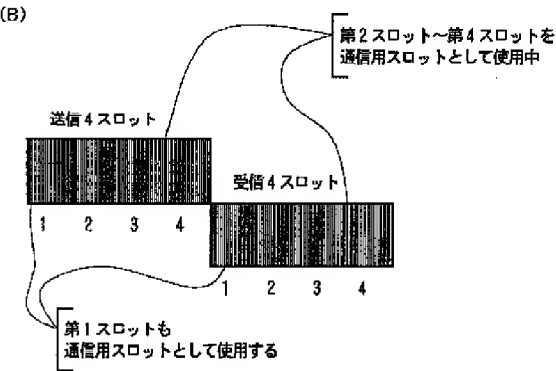
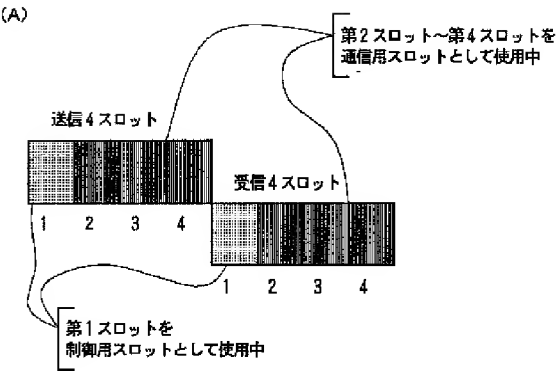
[Drawing 14]



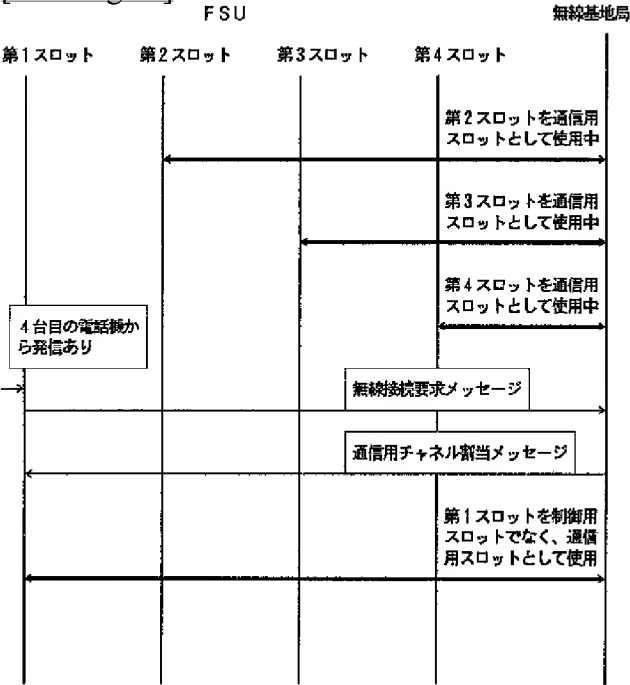
[Drawing 15]



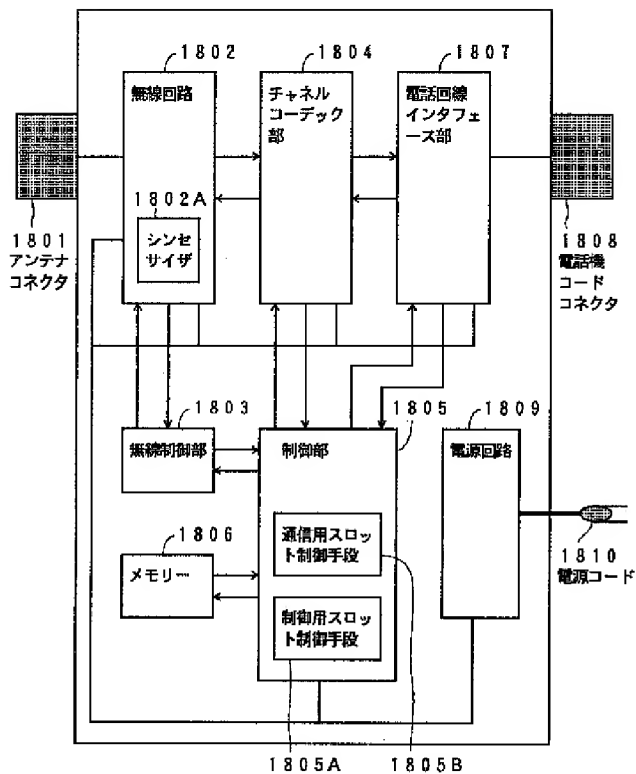
[Drawing 16]



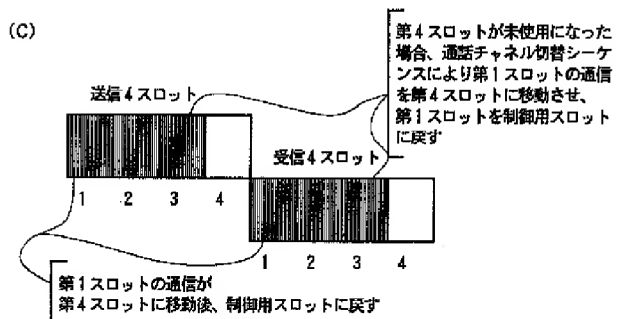
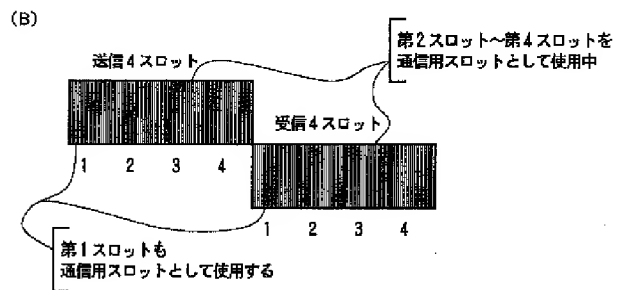
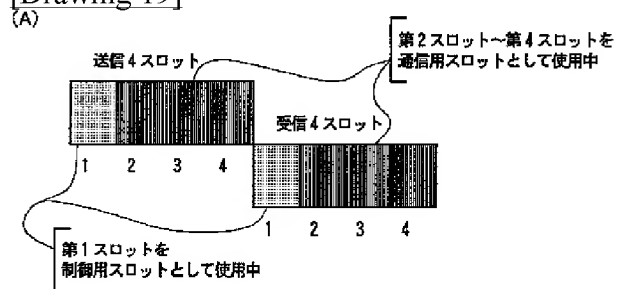
[Drawing 17]



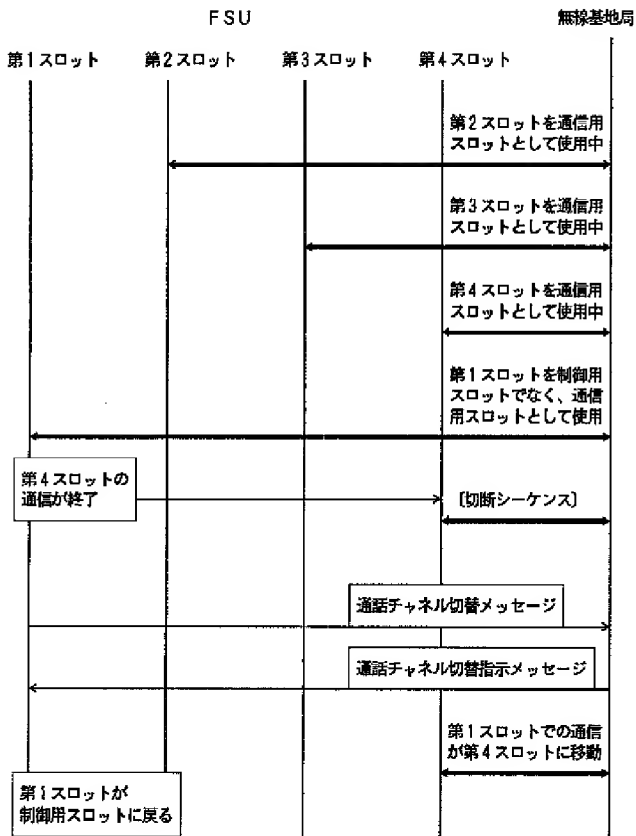
[Drawing 18]



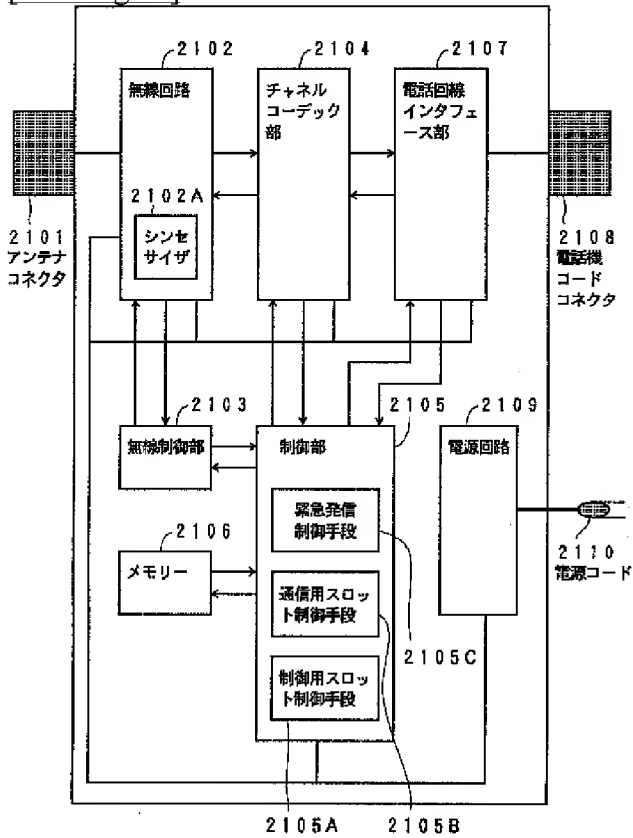
[Drawing 19]



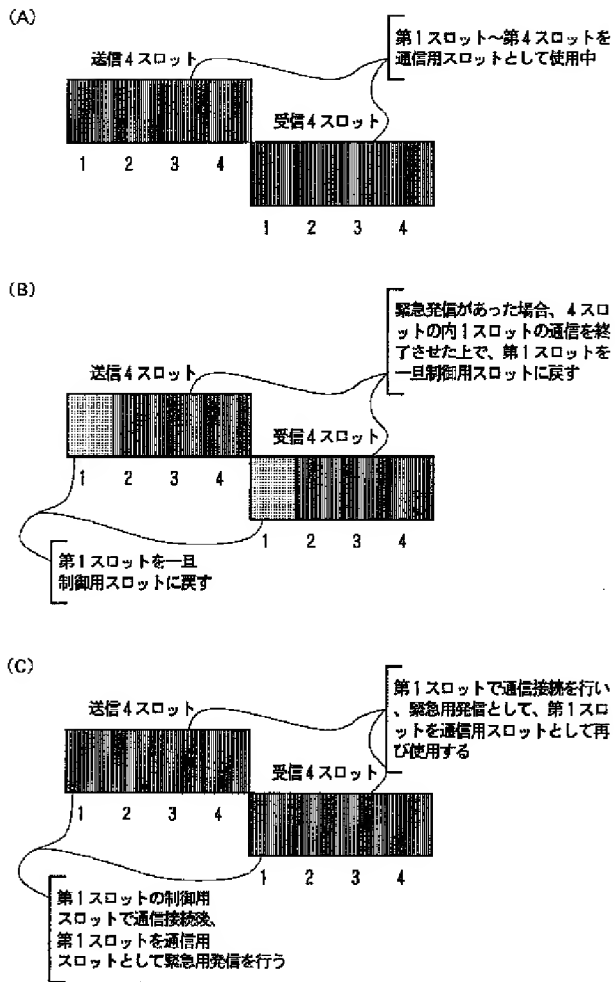
[Drawing 20]



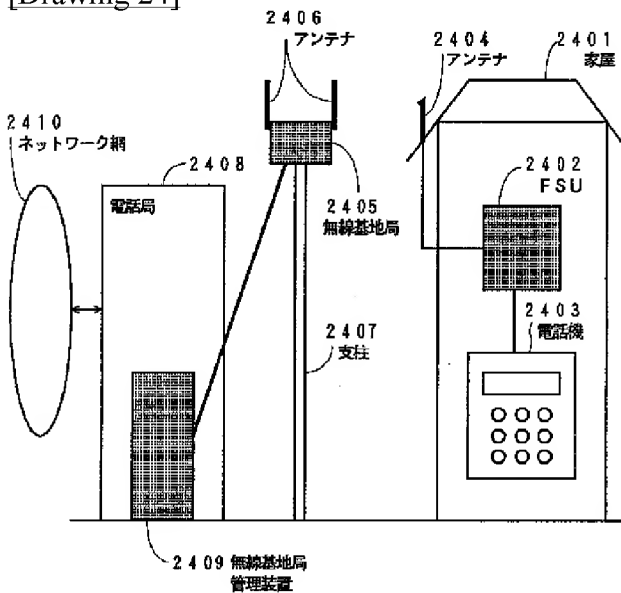
[Drawing 21]



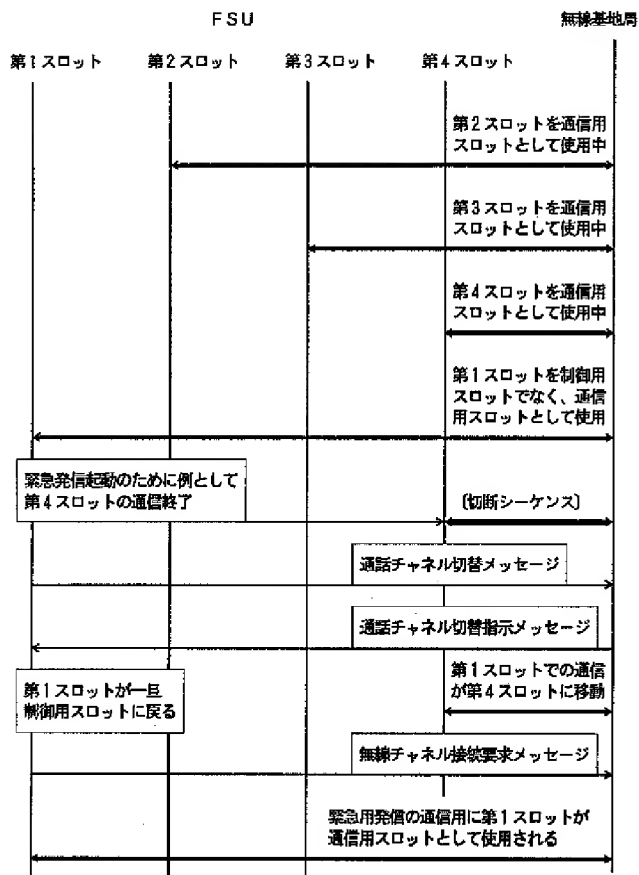
[Drawing 22]



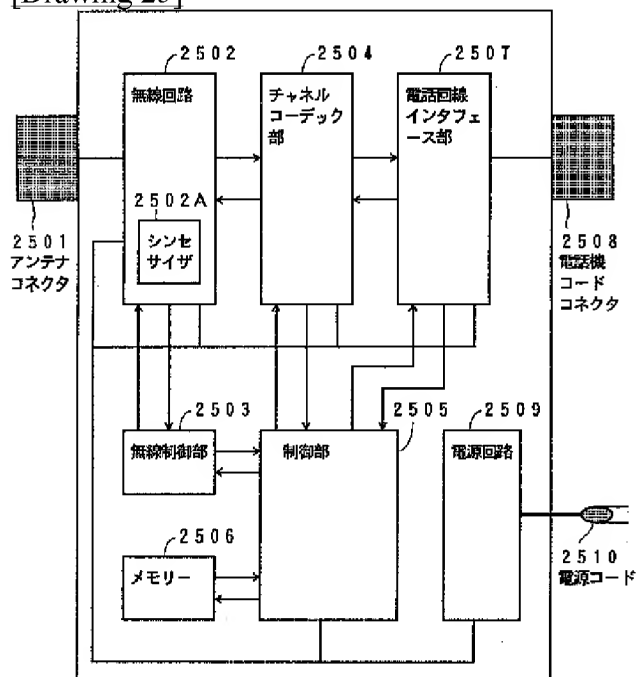
[Drawing 24]



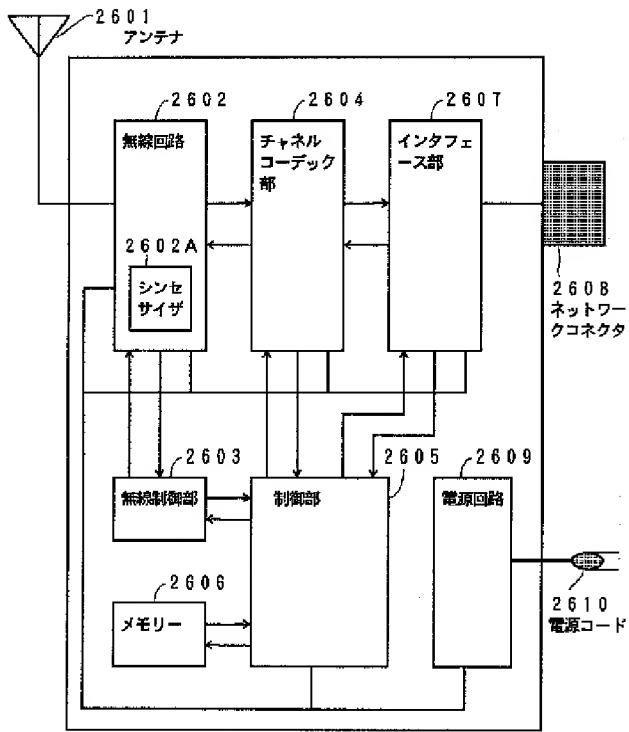
[Drawing 23]



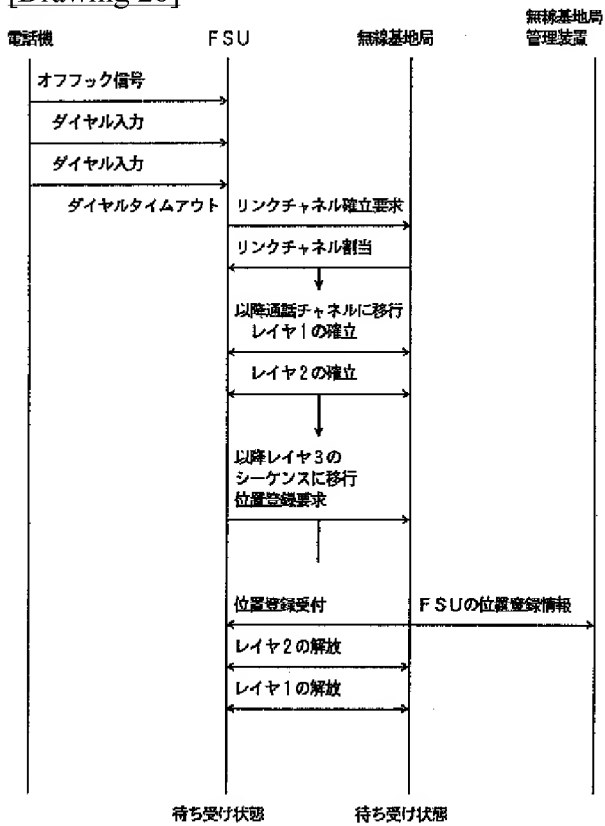
[Drawing 25]



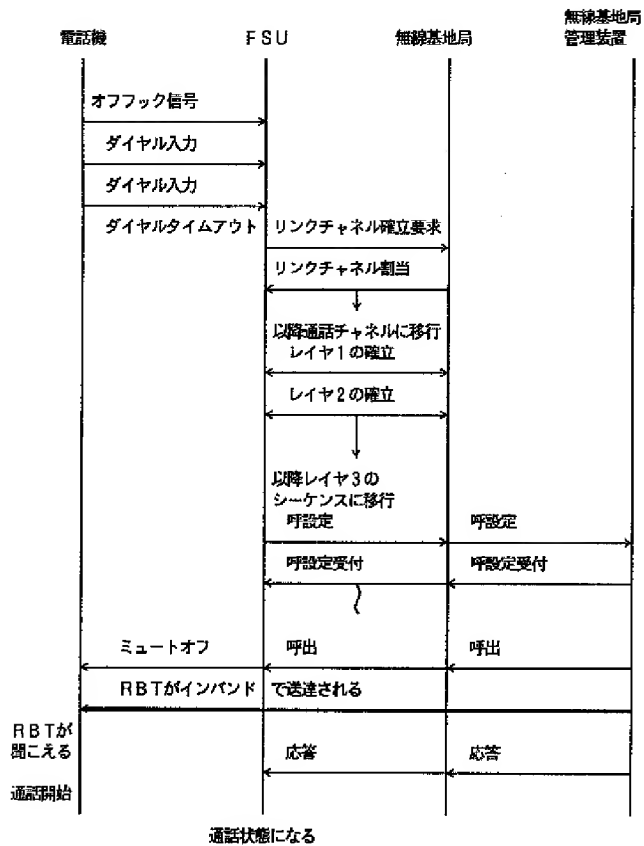
[Drawing 26]



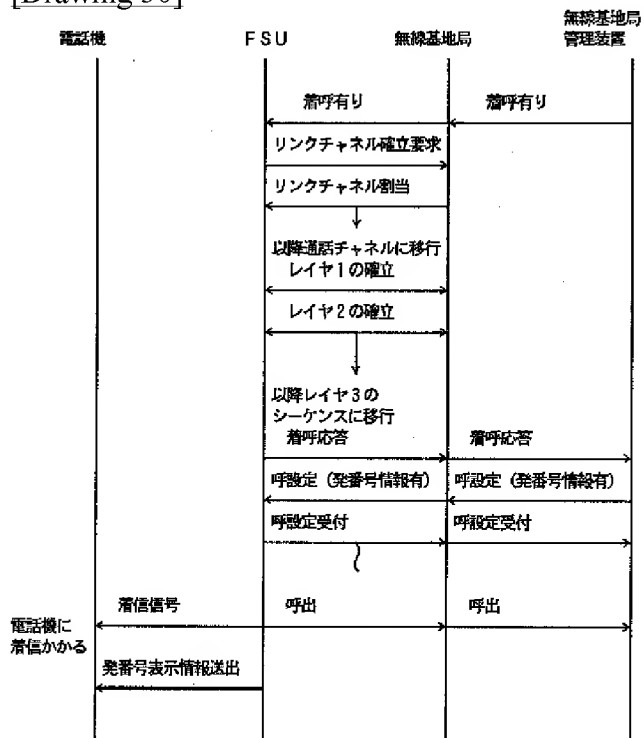
[Drawing 28]



[Drawing 29]



[Drawing 30]



[Translation done.]